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PREGNANCY AND TUBERCULOSIS*

David A. Stewart, B.A., M.D.

Medical Superintendent, Manitoba Sanatorium, Ninette: Assistant Professor of Medicine, Manitoba University

Part I—The Effects of Pregnancy on Tuberculosis

THERE is plenty of scope for discussion, and room for difference of opinion, when a tuberculous woman is found to have become impregnated, as to what can be done and what should be done about it; but there is no difference of opinion as to this, that in most cases, and in the long run, the child-bearing cycle will have a very unfavourable effect on the woman who has pulmonary tuberculosis.

Among the practitioners of an earlier day, chiefly men interested in obstetrics, who perhaps did not follow their patients much beyond the time of delivery, there was an idea that a certain proportion of tuberculous women were actually helped by pregnancy. Perhaps some anæmic or bronchitic, nervous or under-par women, wrongly classed as consumptive, may have been improved, even permanently.

Even tuberculous women may frequently show improvement, usually temporary, during some part of the term of pregnancy. In a recent paper which paints this silver lining a little broader, perhaps, than usual, Dr. J. H. Elliott points out that the pregnant woman, if she eats, digests and assimilates well, has the advantage of utilizing food elements better than her usual, and "A form of hypernutrition, the products of which are intended for the fœtus, can be very useful to the mother who thus derives a certain profit from her greater histogenetic activity." However, in the later months of pregnancy, "A demand for decalcifiation of her own osseous system, the resources of which have already, perhaps, been depleted on account of her tuberculosis . . . . leads to a condition of demineralization unless digestion and assimilation are active."

Elliott's conclusion is not so very different from the dictum of Bacon that *many* tuberculous women do well in the first three months of pregnancy, *fewer* in the second three months and *very few* in the last three months.

And the termination of pregnancy is by no means the end of danger. The most fateful part of the child-bearing cycle for the tuberculous woman begins with parturition does not end there. Bacon states that one-third of child-bearing women who are actively tuberculous die within a year following labour. Of two hundred child-bearing women treated in the Manitoba Sanatorium, reported upon in 1917, the breakdown to tuberculous disease appeared to have occurred during the nine months of pregnancy in twenty-five per cent., or at the rate of nearly three per cent. per month; in the one month following labour, in twenty-four per cent., or at the rate of twenty-four per cent. per month; during the next twelve months, the period of lactation, in thirty-six per cent., or three per cent. per month; and in the interval between child-birth cycles, in fifteen per cent., about one per cent. per month. The damage in these cases became apparent in the one month following parturition as often as during the whole nine months of pregnancy, or eight times as often as in any other one month in the cycle; and of break-downs during the cycle, only one-fourth occurred before, and three-fourths after the child had been born.

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*(Part 2, dealing with "The Treatment of Tuberculosis Complicated by Pregnancy," will be published in a later issue.)

Pregnancy, then, is a complication, and maternity often a disastrous complication of pulmonary tuberculosis. Funk reports that thirty per cent. of married women, patients in the Phipps Institute at Philadelphia, dated the onset of acute symptoms of tuberculosis to pregnancy or parturition. Davis of Milwaukee quotes Trembly of Saranac as stating that among 250 tuberculous mothers, active disease in 63 per cent. was first discovered after the birth of a child. In 29 per cent. of the tuberculous women observed by Schauta the disease originated or became recognizable during pregnancy or the puerperium. Thirty-seven per cent. in Fishberg's series considered that they had no symptoms of tuberculosis until after one or more childbirths. Jacob and Pannwitz, to quote still farther from data collected by Norris and Landis and also by Davis, found that 25 per cent. of 337 tuberculous women attributed the origin or aggravation of their tuberculosis to pregnancy. Maragliano reported 59 per cent. According to Scarborough 47 per cent. of 200 tuberculous married women in the Iowa State Sanatorium considered that active symptoms first appeared after childbirth. In the Ohio State Sanatorium, Douglas and Harris found among mothers 37 per cent. in whom pregnancy appeared to be the cause of tuberculosis activity. Pregnancy was found according to Norris and Landis to have had a bad influence upon the course of pulmonary tuberculosis, in 75 per cent. of the cases of Lebert, 64 per cent. of those of Deibel, 70 per cent. of Rosthorn's, 73 per cent. of Herman's, 94 per cent. of the patients of Pankow and Kepperle, 77 per cent. of Reiche's and 38 pre cent. of Freud's. Von Bardeleben considered that pregnancy gave an unfavourable turn to tuberculosis in 71 per cent. of his cases and was fatal in 47 per cent. McSweeney and Wang conclude that in some women "pregnancy and labour whip a slightly active tuberculosis into a rapidly advancing and quickly fatal disease."

The saying has been attributed to Dubois and also to Louis that a tuberculous woman may bear the first childbirth well, the second with difficulty, the third not at all. Of the women in the Manitoba Sanatorium series already referred to, the first childbirth seemed to have been the cause of one-fourth of the break-downs, the second of one-fourth, the third of one-fourth and childbirths beyond the third, of the remaining fourth. A miscarriage seemed to have been more damaging than a childbirth. The whole series of tuberculous mothers showed on an average an advance in the progress of their disease about 20 per cent. greater than 1900 other Sanatorium patients.

After all allowances have been made, the conclusion cannot be avoided that child-bearing has a definite place in favoring the progress of tuberculous disease. It can break down resistance, light up anew old pre-maternal lesions and bring about the first sign of breakdown in one who has never before shown evidence of the disease.

This is not strange, but only what might be expected, when the events of the child-bearing cycle are considered in relation to the tuberculous woman. Pregnancy puts an added strain upon the whole nervous organization and on the organs of assimilation and elimination. Nature's arrangement for better assimilation during this period is very often counterbalanced by impaired appetite, nausea and vomiting, though it is said that tuberculous women get off easier than others. Even if metabolism should be bettered the demand is also increased. What vital reserve a tuberculous woman may have, which should be consecrated to the arrest and cure of her disease, is robbed from her by pregnancy. The actual physical burden of a gravid uterus is considerable. The lungs, with other viscera, are pressed upon, perhaps with some benefit to pulmonary disease, but if so, with corresponding harm when the pressure is suddenly removed at parturition. Van Voornveld believes that the sudden re-expansion of a compressed lung after childbirth is the greatest single menace to tuberculosis in the whole cycle, and recommends artificial pneumothorax as almost specific treatment in case of pregnancy in a tuberculous woman.

Parturition with laceration, loss of blood, anæsthesia and changes in pressure involves an amount of shock comparable to that of a laparatomy. Over-strain and violent respiratory efforts are not only most exhausting to an already enfeebled woman but tend also to force infective material from old foci into new lung areas. In autopsies upon women who died of tuberculosis after labour, Hanan found such new areas of infiltration. Van Voornveld considers that a miliary type of tuberculosis may thus be set up which may simulate and be confused with puerperal sepsis.

Lactation can be avoided, and needless to say, should be; indeed must be; but child care is even more burdensome on that account. The birth of a child into a home doubles work for the mother who is nurse and housekeeper as well, and disturbs rest. Few mothers can make pregnancy and child care their one occupation. For most, these are new burdens which must be added to a load already heavy, sometimes heavier than can be borne.

To believe that such a degree of strain and stress, so great a disarrangement of habit, such interruption of rest, may break down a woman with partly patched up tuberculosis, or, added to other burdens, one with latent disease which has not yet shown open symptoms, it is not necessary to believe that childbirth creates any specific predisposition. The *quantity* of the over-strain, apart from the *kind*, explains the breakdown. If the ordinary routine of an ordinary woman under ordinary conditions has resulted in breakdown to tuberculosis, can the same woman, with the same disease still latent, add to her ordinary burdens the extra strain of pregnancy, childbirth and child care and expect to avoid harm? For the woman who carries the mortgage of a previous tuberculosis, child bearing, which will almost certainly mean expenditure of strength away beyond income, is a very risky speculation. If it is ever to be considered, all resources must be investigated and the whole cost counted.

Should a woman known to be, or to have been actively tuberculous, ever risk maternity? Like most large questions this cannot be answered categorically. Even normal maternity is not altogether without danger, but always means sacrifice, and many women who have been tuberculous will demand motherhood even if their danger and their sacrifice are to be beyond the usual. Where should the line be drawn?

Pregnancy should not be allowed in a woman who has *ever* reached the anatomical far-advanced stage, or *ever* had far-advanced symptoms. By "far-advanced" I do not mean coarse râles, a hollow cheek, and a cavernous cough, but a stage of the disease consistent with very fair appearance, popularly considered as "early" and unfortunately usually described also by many physicians as "early" or "incipient."

Pregnancy should never be allowed in the presence of active symptoms, however slight, or connected with however slight a lesion, and not for years after such a lesion and such symptoms have cleared up.

It should not be allowed until the disease, which has not at any time been severe, has been apparently arrested for at least three years, or still longer if bacilli have ever been found in the sputum.

When may pregnancy in a tuberculous woman, or rather in one with a tuberculous history, be considered?

If, when the disease was active, the lesion was small or moderate in extent; if the course was in every respect favorable, the arrest definite; if there has been freedom from symptoms for from three to five years; if, during that interval, strength and resistance have been well tried out at ordinary work with no evidence of weakening or break-down; if at the same time living conditions are good; if it is possible during practically the whole period of pregnancy and child-care to have, if necessity should arise, release from other burdens, and if there can be experienced, cautious supervision of the mother during the whole period by one who knows the ways of tuberculosis, pregnancy can be allowed in a tuberculous woman with some confidence that it will not lead to a breakdown. But strait is this gate, and narrow this way, and few there be of the women who have ever been tuberculous who can go in thereat.

Women who are or have been tuberculous should be plainly and frankly told of the danger of pregnancy. I have made it a rule to let no woman of child-bearing age, who was definitely tuberculous, whether married or unmarried, go from under my care without such a statement, and have discussed the same matter with the mothers of younger girls. While some with a history of tuberculosis may risk maternity, these are the carefully chosen few, and for the many the old rule holds that the tuberculous woman should not marry, or if married should not become a mother. The dangerous association of maternity and tuberculosis should be more widely known. Indeed, there would be no harm in having people in general realize that while motherhood in a normal woman is a normal function, in a woman weak or ill it is pathological.

METHODS OF STUDY OF EARLY DIABETES*

J. J. R. Macleod

Professor of Physiology, University of Toronto

In the study of no other non-infectious disease has there been closer collaboration between laboratory and clinical investigators than in that of diabetes. Indeed this was one of the first diseases in which such collaboration was attempted and it is significant that the most important steps in the advance of knowledge in this field have usually been made by men who have themselves been thoroughly familiar with the experimental investigations, often by actual participation in the work, while at the same time engaged in clinical practice.

Laboratory methods have been more particularly used in the diagnosis of very early cases and in determining the severity of the disease in late cases, particularly in following the effects of treatment and in the detection of threatening coma. My remarks will concern the early diagnosis exclusively.

The earliest symptoms of the disease consist in a weakening of the powers of the body to utilize carbohydrate, and it will be simplest if we review more or less in chronological order the various methods which have been employed to guage this. We shall incidentally consider the limitations of each method

1.—*Assimilation limits.* Worm Müller, Hofmeister, von Noorden and others found that 100 gm. glucose did not cause glycosuria in healthy persons, and von Noorden stated that if it did so the person was liable later to develop all the symptoms of diabetes. He elaborated a therapy based on the principle of allowing carbohydrate just short of the amount which could be assimilated. There are several objections to this method. In the first place the rate of absorption from the intestine and consequently the rate of emptying of the stomach, as well as the state of intestinal digestion, must be important factors in the determination of the assimilation limit. Even if we discount this digestive factor, the taking of large amounts of glucose all at once is highly abnormal since it suddenly floods the blood with an excess to which it is unaccustomed. Even normal substances become poisons when they are present in the blood in excess, and the ability of the organism to excrete the excess need not be proportional to the efficiency of its carbohydrate metabolism. Quite apart from these general considerations there are certain practical objections to this method; for example, when more sugar is given than that which represents the assimilation limit it does not produce proportional increases in sugar excretion, and when the amount is far beyond 100 gm. in many normal individuals, it may be impossible to cause glycosuria. Both these results indicate that the idea conveyed by an assimilation limit is unsound and that many obscure factors are involved in determining the incidence of glycosuria following excessive ingestion of sugar.

2.—*Utilization value.* Recognizing the abovementioned objections, Blumenthal tried to determine the extent to which sugar solutions could be injected intravenously at short intervals without causing glycosuria. He found that about 0.8 gm. glucose per Kg. body weight and hour could be utilized in this way without causing glycosuria in rabbits (cf. Diabetes). The objection to this method in the diagnosis of diabetes in man depends on the obvious technical difficulties and on the fact that the injections are not really continuous.

3.—*Saturation values.* Woodyatt following the suggestions arising out of Blumenthal's work and supported by the theoretical consideration that sugar is being constantly produced and used in the body—that its metabolism is dynamic and not static—devised a pump by which dextrose solutions could be continuously injected intravenously at varying rates. By this means the rate of production was maintained at a constant high level which could be progressively raised until sugar appeared in the urine. At an amount just short of that which causes glycosuria (*i.e.*, the saturation level) it is plain that sugar utilization must be proceeding at the same rate as the injection. It is interesting that the saturation level was found to stand at 0.85 gm. glucose per Kilo body weight per hour, both for man and the laboratory animals. This constancy in level is in itself a fact of great significance. In a man of 70 kg. it means that as much as 60 gm. of glucose can be utilized in 1 hour, or 1440 gm. in the course of 24 hours. It was further observed in connection with these experiments that the degree of dilution of the dextrose solution did not affect the results. Thus must indicate, either that any tendency to blood dilution, due to injection of the weaker solutions, must be immediately rectified by excretion of the excess of water, or, that it is not the concentration of dextrose in the blood but the total amount of this substance in the body fluids that counts—a rather difficult mechanism to comprehend.

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*Contributed to the symposium on Diabetes at the meeting of the Ontario Medical Association at Niagara Falls, May 1921.

4.—*Blood-sugar curves.* In measuring assimilation limits towards sugar or starch given by mouth, there are, quite apart from the rate of absorption from the intestine, three functions in the body upon the activity of which the excretion of sugar depends; the glycogenic function of the liver, the utilization (and glycogenic) function of the muscles and the sugar excretory function of the kidneys. In order to eliminate one of these, namely the excretory function of the kidneys, it has become the custom to examine the concentration of sugar in the blood. This has become feasible by the introduction of rapid and accurate clinical methods for determining the percentage of dextrose in small quantities of blood. There are two periods during which these estimations can be expected to be of value: (1) some time after absorption of carbohydrate from the intestine has been completed; (2) at varying periods after the ingestion of carbohydrate food. In the first case we determine the level of blood sugar concentration at which the balance between production and utilization of sugar is taking place in the organism. This level is always found to be raised in the later stages of diabetes, but it may be perfectly normal (at about 0.08 per cent. in the incipient stages of the disease.).

In the second case, we determine the combined efficiency of two oppositely acting functions, namely, the function of the liver and the utilization function of the tissues, and evidence is gradually accumulating to show that the behaviour of this so-called post-prandial blood sugar curve is valuable in the diagnosis of early diabetes. It will therefore be important for us to consider somewhat more in detail the salient features of this method of investigation.

A specimen of blood is taken from the arm vein the first thing in the morning, and immediately afterwards the patient is given 100 gm. dextrose made into a lemonade, specimens of blood being again examined, preferably at half-hour intervals, for 3 or 4 hours thereafter, and the results plotted on coordinate paper with percentages on the ordinates and time intervals on the abscissæ. Specimens of urine are also examined at the same time as the blood.

There are three features of the curves to which attention must be directed, the height to which it rises, the time at which the maximum occurs and the time it takes to return to the normal level. Considerable variation occurs among different individuals but in general the maximum should not go above 0.16, it should occur in from 30-60 minutes after taking the sugar, and the normal should be regained in two hours. Furthermore, in a strictly normal individual no sugar should be found in the urine by the usual clinical tests. Occasionally, a person in whom there is no reason to believe that any tendency to diabetes exists may show a much higher curve, although as far as can be judged from the literature, the opposite, namely, a person with decided premonitory symptoms of the disease, never gives a normal curve. Humphreys and Williams, for example, have recently published observations which when plotted in curves show practically no difference between normal persons and those exhibiting diabetes in very mild form. The conclusion which I would draw from the recorded observations is that the blood-sugar curve taken alone is not sufficient evidence upon which to base a diagnosis of diabetes in its very earliest stages, except perhaps in the hands of those who have had very extensive experience with the disease.

If sugar is found in the urine with a blood-sugar curve that does not rise above the level of 0.17 per cent., it indicates that the kidney is allowing the sugar to leak too readily into the urine. In the great majority of normal persons no clinically detectable glycosuria occurs below this level, and if it does so it indicates that the kidney is allowing sugar to leak too readily into the urine, the condition being styled renal diabetes. Obviously this condition can be diagnosed with certainty only provided the blood and the urine are both examined in the above described manner. It is a condition that is probably much commoner than was suspected before the introduction of these modern methods of diagnosis, although its existence was suspected in certain types of cases in which small percentages of sugar were repeatedly found in the urine, often quite independently of the taking of food and without any of the other symptoms of diabetes. It is interesting that a similar condition can be produced experimentally by giving the drug phlorhizin. It is obvious that it is of extreme importance that means be taken in all cases of mild glycosuria to test the renal threshold for sugar. On the result of the test depends the prognosis and the proper treatment of the case.

This brings us to an aspect of the diabetes problem which seems to me to be of great importance, namely the precise significance of the renal threshold. Although it is usually assumed that the urine of normal persons is sugar free, this is not strictly the case. It is only sugar free in so far as the clinical tests are concerned, but if precautions be taken to remove from the urine various substances which make it impossible otherwise to detect the sugar, then it is found that normal urine contains sugar of which about one-half ferments with yeast and is presumably glucose, the other, non-fermentable half being some sugar the precise nature of which is at present uncertain. On an ordinary diet there is usually from 1 to 1.5 gm. of this sugar in the 24 hours urine, but this varies according to the amount of carbohydrate in the diet. Benedict and his co-workers have recently investigated the relationship which exists between the diet and the sugars of normal urine, and they have made the interesting discovery that the ingestion of even small quantities of dextrose cause decided changes, the most conspicuous feature of which is a diminution in the non-fermentable moiety, which is always greatest in the early morning urine. This normal excretion of sugar is called glycuresis. As carbohydrate increases in the diet the fermentable moiety rises, and Bailey has shown that up to a percentage of 0.17 in the blood, the sugar of the urine runs approximately parallel, indicating that the kidney is more or less passively allowing the sugar to escape, but that beyond 0.17 in the blood the percentage in the urine rises very rapidly out of all proportion to that in the blood. This would appear to indicate that above this level the kidney assumes an active secretory function towards the blood-sugar. Renal diabetes therefore is characterized by the development of an active sugar-excretory function by the kidney at a blood-sugar percentage below 0.17.

These observations indicate that even a normal person is diabetic in a certain sense, and that the diagnostic sign of glycosuria is more or less arbitrary since it merely represents a degree of glycuresis capable of causing reduction by the ordinary clinical tests. Taking all these facts into consideration, one may ask, what then is the proper routine to adopt in the diagnosis of early stages of this disease? The urine should be examined by a reliable clinical test during at least two periods of the day, namely, the night urine and the urine voided within three hours of the largest meal of the day. To examine a sample of urine passed without regard to the interval elapsing since the last meal was taken is quite likely to be misleading, for even in decided cases of mild diabetes urine passed some time after food ingestion may be quite free of sugar. If no sugar is found in any of the specimens, no clinical diabetes can exist. If sugar is found in any of the specimens the blood-sugar should be examined and a careful comparison made between the sugar of the blood and urine in order to see that the case is not one of renal diabetes. The objection to this method in general practice is that facilities do not exist for estimating the blood-sugar outside the larger towns and cities. With the great simplification in the technique of blood-sugar estimations, the better opportunities for learning the technique and the increasing availability of the necessary apparatus, the time is not far distant when a great many practitioners will be in a position to make these estimations. I do not mean that every practitioner in the community should specialize in laboratory methods, but I can see no reason why a certain number should not do so and the others employ them as specialists. The technique is certainly no more exacting than that necessary for the detection of the tubercle bacillus or a Wassermann test. I need scarcely point out to this audience of practical men the extreme importance of early diagnosis in this disease. Everyone who has had extensive experience with it agrees that in most cases the onset is very insidious and that proper control of the diet will very often prevent its progress.

A COMPARATIVE STUDY OF MEASLES AND GERMAN MEASLES

D. G. Campbell, M.D., and E. V. Murphy, M.D.

Physician, and Superintendent, the Alexandra Hospital, Montreal

DURING the three years 1915, 1916 and 1917 we had an unusual opportunity of studying these two diseases at the same time and in large numbers, and we felt that perhaps there might be some interest in reporting our observations.

During these three years there were admitted, in all, classed as measles, 821 patients, of whom we consider 124 to have had German measles.

Although some authorities claim that there is but one disease, we do not see how it is possible to reconcile our findings with that view; and while some cases certainly have been difficult to classify, on account of the mildness of the physical signs, ordinarily there has been little room for doubt, and the cases have, in nearly every instance, been sent in to the hospital correctly diagnosed.

Certain outstanding features tend to differentiate the two conditions from the outset:

1. *The history of onset.* In German measles there is neither that characteristic three-days' coryza and malaise preceding the rash nor is there the irritating cough. In practically all the German measles cases we get the same story: the patient on awakening found the face or body covered with a rash, and associated with this rash in some cases was some drowsiness or headache.

2. *The temperature.* On admission to hospital the temperature in our German measles cases averaged 99.1 to 99.2; in only 5 cases did it go above 101, and there was in each case some complication to account for the rise, whereas in our measles series the average temperature was over 102 at the time the rash was well-defined.

3. *The age incidence.* We were surprised, on studying our figures, to find how few children were seen with German measles; only six were admitted under ten years of age. We recognize, of course, that in this disease on account of its mildness children would not not be sent to the hospital as frequently as adults, but on the other hand we have had adults from institutions in which young children were undoubtedly exposed to the infection. One such very interesting situation arose when the assistant head nurse of a baby hospital developed typical German measles and was isolated in her room. On the fifth day of her illness occurred the disastrous fire in the Grey Nuns' building, in consequence of which a great many infants and young children were shifted to this institution, necessitating the use of the full staff, and with permission this nurse went on duty again, but not one case developed among the babies.

4. *The rash.* In a typical case of German measles you get two types of rash: on the limbs and buttocks you find a patchy rash resembling that of true measles, while on the face, neck and chest, anteriorly and posteriorly, is found a well-defined punctuate rash resembling that of scarlet fever.

Many cases of course do not show much rash, and that little only for a very short time, but the characteristic feature of the rash we believe is that you find spots suggestive of measles about the buttocks and legs, but never on the face: here they are of a more punctuate pin-point appearance and tend to coalesce into a general flush.

In measles, on the other hand, the rash is constant, first coming out as a rule on the forehead, behind the ears, and on the face, and shortly afterwards on the chest and arms. The spots are small and not intensely red at first, but as they enlarge they become more dusky red and in about 24 hours the rash is widespread over the body. The patches now become larger, are of a more purplish hue, and become raised above the surface of the skin and are distinctly palpable. Some of these patches meet and appear to coalesce, but in every case one can find areas of normal skin between them. But from the rash alone the diagnosis was frequently almost impossible, as is well illustrated by the following case: a man aged 21 (No. 661-16) was sent from the venereal ward of one of the city hospitals, where he had been under treatment for gonorrhœa, with a rash very suggestive of measles. Three different diagnoses were made by responsible physicians: measles, German measles, and secondary syphilis. He had a positive "Wassermann," but the rash faded in a couple of days without any treatment and without any other signs of the secondary stage of syphilis, so we finally felt convinced that he had had Rubeola.

Another man, who from the history of exposure was thought to have a mild type of true measles was so admitted into the ward. On the seventh day in hospital he developed a typical measles rash, preceded by coryza and photophobia, etc., by which we were satisfied that the original diagnosis was incorrect.

More than one copaiba rash was sent to the hospital during the three years, but the difference is fairly easy to distinguish when one is seeing cases day by day and consequently no harm was done.

5. *The glandular enlargement.* The enlargement of the glands in the posterior cervical region was very striking in the German measles cases and was not part of a corresponding general lymphatic involvement, nor was it associated with any signs of toxæmia. This was noted as marked in 62 cases, exactly 50 per cent. of this series.

On the other hand, in true measles 75 per cent. of the cases showed some enlargement of the glands of the neck, but it was more or less proportionate to the degree of toxæmia and was but a manifestation of the general lymphatic reaction.

6. *The liability to infection.* The extreme contagiousness of measles was well illustrated by the epidemic which supplied most of our material. Apparently beginning south of the Lachine Canal in October, 1916, it spread rapidly in two lines up into Westmount and up through the centre of the city to the North End, where it was prevalent throughout the succeeding winter.

The contagiousness of German measles appeared to us less marked than that of Rubeola, but one must bear in mind that many cases undoubtedly escaped observation. One interesting case was seen in which the patient had had a letter from her husband overseas while he was suffering from German measles. At the time she developed the disease no other source of infection could be traced and the question was asked, could the letter transmit the disease?

The question of immunity. In no instance among our admissions did we have any evidence of a second attack of German measles, but quite a few were recorded among the true measles cases, although most authorities assert that this is a rare event. An interesting relapse or re-infection occurred in the practice of one of us outside the hospital limits. A girl (Violet N.) aged six years, was seen on December 20th with a typical measles rash, temp. 103, coryza, etc., and the disease ran the usual course of a mild attack. On December 30th, a sister (Lizzie N.) aged seven and a half years came down with typical measles, followed two days later by the baby, aged four years. On January 11th Violet again took ill, with a temperature of 102 . coryza, cough, etc. and this was followed in a couple of days by another typical measles rash over the whole body, just 22 days after the original rash had appeared.

The period of incubation. Our information on this subject so far as German measles is concerned is too vague and fragmentary to be of any value.

But we have had many opportunities of watching epidemics of Rubeola in institutions, and have noted with what unerring regularity a ten days' interval has elapsed between groups of cases.

Koplik spots. These were only seen in a small percentage of the admissions and those mainly the institutional cases which were sent in early. In no case of German measles were there any observed.

The complications. In German measles complications were practically absent. Three cases in our series (all nurses) developed adenitis, and two of these went on to suppuration, while 10 either had on admission or showed shortly afterwards tonsilitis, and finally one case developed laryngitis. One patient while in hospital developed pneumonia accompanied on the 5th day by empyæma sufficiently marked to demand immediate surgical interference. He died a few days later the only death among the German measles cases.

The complications of rubeola, however, were numerous and serious.

Bronchitis, although not so universal as in typhoid fever, was very frequent, while at least 95 per cent. of the cases complained of cough on admission; this is in marked contrast to the German measles cases of whom only seven made any complaint of cough when admitted.

Broncho-pneumonia was present on admission or developed subsequently in 35 cases and was the condition we learned to dread more than any other. Of the 35 cases, 15 died while in hospital, and that some of the others suffered subsequently after leaving the hospital we feel certain in the light of previous experience.

Suppurative otitis media, was, with the exception of bronchitis, the most common complication in this study; there were 85 cases in all, while catarrhal ear conditions not going on to suppuration were equally frequent.

We are of opinion that our percentage of cases (12 per cent.) showing suppurative otitis media is much more than one ordinarily finds in private practice, but many of our cases came to us in a very miserable state, with profuse discharge from the eyes and nose, and quite possibly these served as a focus of infection to others.

That only four of these cases went on to acute mastoiditis is, we feel, a subject for congratulation to the nursing staff. On the other hand, many cases continue to have a discharge from the ear for many weeks if not months after their recovery from the measles. With the ever-present danger of acute mastoiditis, our disposition of late has been to favour a simple mastoid operation in these stubborn cases.

Rhinorrhœa in a troublesome form,comparable to the otitis media, was noted in 24 cases and was found very resistant to any treatment, lengthening the stay in hospital considerably.

Laryngitis was much more common and more dangerous in our series than one would expect from a perusal of the literature. It was noted as *severe* in 32 cases, and in 12 of these there was an associated œdema of the glottis which necessitated intubation in 6 cases and a tracheotomy in one other. This œdema was exceedingly distressing to the patient and was the cause of death in five cases. The exact etiological factor giving rise to this condition is still obscure. In two cases at autopsy a Klebs-Loeffler bacillus was obtained, but in no single instance was any membrane demonstrable. Moreover, after the first case, in which the autopsy report showed diphtheria bacilli present, all patients with severe laryngitis were given 10,000 units of antitoxin. Clinically, the results were not what one looks for in diphtheria; and in one of the cases intubation was necessary 5 days after the administration of the antitoxin. In our experience the only treatment which gave any relief to the severe grades was intubation and even that in some proved but of temporary value. These cases were all very ill and toxic and it seemed to us as if the involvement of the mucous membrane so common in the nasal passages had extended down into the larynx and trachea.

The alimentary system was comparatively little involved. Vomiting and diarrhœa as a symptom of onset was noted in 7 per cent., and acute enteritis occurred in 4 cases during the course of the disease. In all four cases the enteritis was very severe and two of them died. The number of cases is too small to draw conclusions from, but enteritis we are convinced is one of the very grave complications of measles. Our dread of this complication arises from a group of cases not included in this series in which the mortality was very heavy, all the cases showing at autopsy acute hæmorrhagic enteritis more especially of the large bowel.

Stomatitis was very frequent but the source of many of our cases may explain this disparity between hospital and private practice. In the genito-urinary system complications were very rare. Febrile albuminuria was common for a day or two at the onset but no single instance of nephritis as a sequel is recorded.

Vaginitis was found occasionally in this ward, as in all other hospital wards where children are treated.

The effect of measles on menstruation was very distinct. It caused practically all the women patients to menstruate within a few days after admission regardless of their previous menstrual history; but, contrary to rule, it had no effect on the few pregnant women who came under observation.

The eyes: Although photophobia was present in 85 per cent. of our cases, we believe that in none of them was any permanent injury done to the eyes; the majority of the cases responded very rapidly to rest and routine washing with boracic acid.

The treatment as carried out in the Alexandra Hospital was purely symptomatic. All patients were kept in bed for about 10 days, and on a milk diet for the first half of this time; usually we have felt free to discharge them, if devoid of complications, at the end of two weeks.

During those three years, when measles were epidemic in the city and vicinity, there were 48 deaths in this Service, a percentage of 5.7. This is undoubtedly heavier than one finds in private practice, but as is the case in all hospitals we received a very large number of very sick and of dying cases and a large number of institutional children who were congenitally unfit to withstand disease.

As already reported 15 cases died of bronchopneumonia, 5 died of œdema of the larynx and 2 of acute enteritis. Of the others, 3 died of lobar pneumonia, 2 of miliary tuberculosis, one of pulmonary abscess associated with a streptococcic septicæmia and the others either of exhaustion, toxæmia, or within a few hours after admission.

Unfortunately, owing to stress of work and a very reduced staff, autopsies could only be made on such cases as seemed to demand them for some special reason.

In conclusion: After an intensive study of the records of these 821 cases, two facts, in our opinion, stand out most clearly

1. That German measles and measles are two distinct and separate diseases; the one mild and the other severe.
2. That true measles may prove a serious disease, and that the attitude of the laity, and also of many in the profession, in considering measles as innocuous as chicken pox, and in favouring its spread in a family, on the occurrence of infection in one member of it, is one which must be strongly condemned.

TECHNIQUE OF CATARACT OPERATIONS

COLIN CAMPBELL, M.D.

Toronto

ANYONE visiting the various eye clinics of Europe and America must have been struck by the differences in technique displayed.

In England, Morton taught us to stand behind our patient and to use the left hand for the left eye. In Vienna we saw Muller stand always in front of his patient and use the left hand for the right eye. While most of us use the operating table, and in Vienna the patient is semi-reclining, I have seen a missionary in China operate with the patient seated in a chair, holding the eyelid with a small retractor and doing simple extractions with the other hand unaided.

There is nothing original in any of the details I have to present, yet like the clubs in a golf bag, they are not quite the same collection as any others. I merely give the methods which in recent years have in my hands proved safest and most satisfactory.

Dilating the pupil before operating is practiced by many, extracting before iridectomy, has had advocates for years. Capsule forceps are used everywhere, and basal iridectomy was the routine practice throughout most of Europe before the war. It is the incorporating of all four of these details into the operation, which I advocate.

In addition to the usual attention to the urine and chest, I have reason to recall the advice given by Lang so long ago as 1903 to eliminate septic teeth.

We owe it to our patients to have, if possible, a trained assistant.

In cleansing the field, the eyelid margins are carefully wiped with alcohol. If a Lang speculum is used, only the outer eyelashes need be trimmed. I have seen an eyelash carried into the globe where this was neglected. Bushy eyebrows should be trimmed or shaven, the repositor should not brush through hair in transit.

A layer of wet gauze over the face helps to keep the hands clean. Instead of a speculum Hess' retractors in the hands of a good assistant prevent a restless patient from squeezing, and give an aseptic field.

One or two hours before the operation Atropin is instilled once, and I am not yet sure but that it would be better to use it earlier and oftener, as sometimes the pupil is still rigid. Adrenalin is instilled once or twice while cocainizing. The cocaine, 3 per cent., perfectly fresh and sterile, is instilled every three minutes for five times, beginning fifteen minutes before the patient goes to the operating room.

The other eye should get a few drops also; the advantages are obvious.

While good daylight may suffice, facilities for darkening the room and for focal illumination are essential.

Fixation forceps should have two or three fine and very sharp teeth to grip the sclera preferably just below the counter puncture.

I usually cut a liberal conjunctival flap, it gives a fine sense of security, but it does obscure the view in doing a basal iridectomy, so that I am always consoled if I do not get a flap. The incision should be large, nearly half the circumference.

Now as to the four main points on which I base this paper:

1.—Dilating the pupil beforehand: To this I can find no serious objection. Prolapse of a well dilated iris is actually less likely to occur. It is certainly easier to get across, and I feel sure that there is less chance of slicing the iris in cutting out, older teaching to the contrary.

In using the capsule forceps the advantages of a large pupil are many. You can get a much larger piece of capsule and at little or no risk of picking up the iris margin with the unfortunate results that follow.

It is easier to extract your lens, especially a large or sticky one, and it is easier to wash out debris. The pupil is usually still dilated next day, and is easily kept so.

2.—The advantages of capsule forceps in giving a thinner membrane must be obvious to anyone who has used them. Needling is rarely required. The teeth must be sharp and the forceps not too large. Many models are more suitable for veterinary practice. I use Cowper's, with a row of teeth 4 mm. long, and remove as much capsule as possible.

The danger of dislocating the lens is over-estimated. This, and the danger of picking up the margin of the pupil, is slight with sharp forceps a dilated pupil and good illumination. If a capsule is very tough you may be able to lift out the entire lens in its capsule, giving a happy result as to vision. The next point:

3.—Extracting before iridectomy is sound practice even if an ordinary iridectomy is contemplated; and, of course, to do a basal iridectomy before extracting is to invite difficulty in extracting the lens.

(a) In either case after extraction the sphincter sweeps back any tags of capsule from the wound.

(b) There is no hæmorrhage before extraction.

(c) The most painful part, the iridectomy, is postponed until after your lens is out. I admit that some pupils do not dilate and others do not remain dilated, and then iridectomy may have to be done first. Likewise if the suspensory ligament is weak and a scoop is necessary.

Basal iridectomy has four advantages:

(*a*) A round pupil with its normal appearance, absence of glare and better acuity.

(*b*) Not only is there no risk of prolapse if the hole is made large enough, but there is rarely any adhesion of iris to the wound, rarer than with ordinary iridectomy. My experience as a house surgeon taught me that after ordinary iridectomy in a large percentage of cases one or both pillars were adherent to the wound and in many capsule also, and that in the former some iritis was to be expected.

If even ordinary iridectomy is done after, not, before extraction, capsule in the wound is rare and if a basal iridectomy is done it is impossible. As this is perhaps the commonest cause of serious and persisting iritis and its sad results in updrawn and closed pupils, post-operative tension and even sympathetic ophthalmitis, its prevention is of first importance. Incidentally, a quicker convalescence and shorter time in hospital is a pleasing result.

In the after treatment I always tie up both eyes and shield both from the light for three or four days.

The movement of one eye means movement of both. The darkness of Ring's mask favours dilatation, meaning less atropin and fewer dressings with their attendant risks.

I rarely touch them more than once daily. There is no objection to the aged sitting up even next day.

Dark smoke goggles are worn so soon as one eye is uncovered, with, if necessary, a pad over the eye operated upon.

OBSERVATIONS ON THE ÆTIOLOGY OF INFANTILE ECZEMA*

H. P. Wright, M.D.

Montreal

THE earlier teaching concerning infantile eczema was confined to the skin alone and was naturally allocated to the province of the dermatologist, and emphasis of treatment was laid on external applications to the skin. In some instances such treatment was quite satisfactory, but there remained a large number of unsatisfactory cases which were unimproved by local treatment. With the development of Pædiatrics as a recognized specialty in medicine and with a consequent closer study of digestion in infancy it was noted that food seemed to have some relationship to the development of infantile eczema, and it is from this viewpoint that these observations were made.

The name eczema is derived from the Greek, and means "to boil out"; and in the past many diseases of the skin were called eczema: in these, as knowledge increased, further classifications were made. Is it not possible that many diseases still remain classified as eczema which increasing knowledge may reclaim and more scientifically designate?

The regional sensitivity of the skin in infants cannot be overlooked, and it is interesting to note that the thorax, feet and palms are seldom involved in infantile eczema. Sauer applied solutions of phenol in benzol to the cheeks, thorax, buttocks and soles of healthy infants, and he noted that the reactions were more marked in the cheeks and buttocks.

The cases that have come under my observation have occurred in infants all under two years of age, some in breast-fed babies and others amongst those artificially fed.

Eczema in Breast-fed Infants.

As a rule, eczema occurring in breast-fed infants manifests itself in well-nourished babies, but this is not always so. As an example of this type I present the following from amongst several of which I have records.

Baby G. *Complaint:* Eczematous rash on face. *Family History;* Grandmother has asthma. Investigation of the mother's diet revealed that she was eating 3 or 4 eggs a day. Family history otherwise negative. *Personal history:* a full-term child weighing 8 pounds at birth; no instruments used; eczema has been present since two weeks of age.

Physical examination showed a farly well developed baby aged 4 months, weight 11 pounds, with a well-marked eczematous rash on face and neck; examination otherwise negative.

Skin tests. Mother gave a negative reaction to both yolk and white of egg, while baby's reaction was positive to both yolk and white of egg.

Treatment: Recommended that mother should exclude eggs from her diet. One month later a letter was received saying that the baby was completely cured, since then no further communication has been received.

The inference in this type of case is that eczema is caused by an anaphylactic reaction from the egg through the milk of the mother. W. Roy Shannon (1) has demonstrated the effect of food proteins in human breast milk by anaphylactic experiments on guinea pigs.

His conclusions are:

"1. It has been demonstrated that egg protein may be present in the breast milk of some nursing mothers after the ingestion of moderate quantity of egg albumin.

"2. It has been demonstrated as conclusively as possible under the conditions of the experiment that it may cause disturbance in the nursing infant under these conditions.

"3. It is deemed probable that this may occur with other foods that the mother may eat.

"4 It is contended that we must revise our ideas as regards the diet of the nursing mother and must study cases of food disturbances in the nursing infant from the standpoint of what the mother is eating."

Two other cases of eczema in breast-fed children came under my observation with like results although one subsequently died from pyelitis. Egg albumin is the most common offender, but other foodstuffs may act in a similar way.

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*Read before a meeting of the Montreal Medical Chirurgical Society, October 21, 1921.

Eczema in Artificially Fed Babies.

The ætiology appears to be frequently of a similar nature in artificially fed infants, save that the offending protein instead of being indirectly transmitted is directly offered by means of the bottle.

The following two histories are presented as examples of this sub-group:

1.—A. K. Personal History: a full-term infant, normal delivery at birth, weighing 7½ pounds. Breast fed for 2 months; then gradually weaned. From age of 3 months has had a very delicate skin and has had small spots on forehead. At present the formula of food which the infant is taking is: whole milk 30 ounces, barley gruel 10 ounces, canesugar one tablespoonful.

The infant is now 11 months of age, and weighs 21 pounds, has 4 teeth and is well except for eczema, which has been very bad on the face for the last 4 days.

Family History: Father had asthma as a child; paternal grandfather has had eczema all his life, and one aunt had eczema in infancy. No history of gout. In the mother's family no history of either eczema or asthma.

Physical examination showed an apparently well-developed normal body for her age with the exception of the eczema on cheeks.

Skin tests gave positive reaction to barley and to oatmeal.

Treatment: These foods were withdrawn from diet and the eczematous condition disappeared excepting when these foods were again consumed. The baby is at present 18 months old, and last week, two days after it had been fed on oatmeal porridge, had a very definite attack of urticaria.

Several other cases of this type have been observed, some of which gave positive reactions to barley, cow's milk, wheat, etc. A number of other artificially fed babies showed no reaction to any of the foods in their dietary, and these cases as a routine were put on fat-free milk; in those in which the eczema improved cream was gradually added. Those cases that showed no improvement on the withdrawal of the cream were rapidly returned to whole milk. In only one of these cases was an analysis made of the total fat in the stools. In this case in addition to the unusual findings in the amount of fat of the stools a questionable reaction for barley was obtained. The subsequent history showed that the child had a definite idiosyncrasy to barley.

It is hoped to carry on further investigation along these lines during the coming winter, as it would be improper to draw any conclusions from the laboratory results of one case. Therapeutically 5 cases were observed, four of whom did well and one showed no improvement. It is quite possible that the withdrawal of the fat, by diminishing the total quantity of food, caused the eczema to improve, and that the only influence of the fat on the metabolism was on account of its high caloric value.

2.—H. R. V. Personal History: Born at full term, and at birth weighed 9 pounds. Breast fed entirely for 3 months, then started on one bottle of Allenbury's. At age of 4 months while still being fed on breast and Allenbury's and in month of December, mother noticed that cheeks looked "chapped," and she thought this due to cold weather. Seen by a dermatologist, who diagnosed this conditionas one of eczema, treated it by external applica-tions and stopped the use of Allenbury's food. After this the infant was entirely breast fed for a month, and the mother thought it improved, although the eczema did not disappear. It became necessary to wean him at 6 months of age; during the next 2 months the eczema became more aggravated and at the end of 8 months when first observed by me he was on the following formula: whole milk 36 ounces, barley gruel 12 ounces, cane sugar 4 tablespoonfuls; some cream of wheat was also given him. The Family History. Negative.

Physical examination showed a well-developed baby weighing 21 pounds 2½ ounces, with a dry type of eczema of the head, face, neck, chest and abdomen. Otherwise the physical examination was negative.

The skin tests revealed a negative reaction to whole milk; the reaction to barley was questionable. The examination of the stools for quantitative fat by Dr. E. H. Mason was as follows: first specimen, 7.2 per cent. fat; 2nd specimen, 10 per cent. fat. An examination of blood fat was not made.

It was thought that perhaps too much fat was being absorbed, as the normal stool of an artificially fed baby usually has between 30 and 40 per cent. fat (Holt) (2). Consequently the child was put on a diet of skimmed milk (siphoned) and cream of wheat. Three days later the eczema had almost entirely disappeared (31-5-21). About six weeks later child had an attack of diarrhœa and was put on the following formula: skimmed milk, 33 ounces, double strength barley gruel 9 ounces. Within two days the eczema reappeared and so we returned to skimmed milk. The eczema improved again and fat was gradually added to the milk without bad effect. The child is now two years old and eats the usual food taken by a child of that age, and is well and healthy and free from eczema.

In conclusion one seems justified in assuming that there is some relationship between the food and the eczema in certain cases of infantile eczema, and it would seem worth while to investigate all cases of infantile eczema along these lines. It is not advocated that the treatment of the skin by local applications should be neglected but rather that the disease should be treated both by local applications and a regulation of the diet. That there will still remain a group of these cases which will resist treatment is granted, but some advance has been accomplished if another subdivision has been made in the baffling problem of eczema.

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Ethyl Chlorid in General Anaesthesia—Observations made by Arthur E. Guedel, Indianapolis (*Jour. A. M. A.*, Aug. 6, 1921) with the use of ethyl chlorid in general anæsthesia in about 2,000 cases are recorded. These were mostly for operations of from one to five minutes' duration. About 200, however, were for operations lasting from fifteen minutes to one hour each. Nineteen cases carefully studied were of an average length of fifty-three minutes. Ethyl chlorid in overdose produces one of two sets of symptoms. He has designated these as the spasm type and the respiratory depression type. Approximately nine out of ten of all patients overdosed with ethyl chlorid manifest the spasm type. The first indication of approaching spasm is a sardonic grin, due to contraction of the muscles about the mouth; next a beginning contraction of the masseter muscles, and a beginning crowing of inspiration. This crowing, due to partially obstructed inspiration, is the real warning that the dose must be reduced. If the overdose of the drug be continued, the spasm progresses rapidly until, in about one or one a half minutes more, it will have become a complete respiratory obstruction, and a state of peripheral asphyxia is present. The spasm, once inaugurated, develops so rapidly that cyanosis does not appear in the usual case until the obstruction is almost total. The mouth must be opened, the tongue pulled far out and vigorous chest compression made. The depression type is a progressive central respiratory depression, and occurs in approximately one out of ten overdosed patients. From the onset, the respiratory effort grows less both in volume and in rate. The volume depression is greater than that of the rate. With the continuance of the drug in overdose, this depression progresses to a complete respiratory paralysis in from one-half-minute to two minutes, depending on the patient and the vapor tension of the drug. The patient is perfectly relaxed in every way. The picture during the deeper degrees of depression is one of collapse. The picture resembles that of cardiac syncope. But the pulse belies the picture. To the observant anæsthetist there is ample warning of the approach of this depression; and there is no need that it be carried to the degree of total paralysis of the centre. However, should total paralysis occur, resuscitation is simple. There is no respiratory obstruction, and two or three forceful, manual compressions of the thorax serve to eliminate the excess of the drug from about the respiratory centre, and automatic respiration is re-established, to carry itself to the anæsthetic normal in from one to four minutes

SOME NEW ANÆSTHETIC ETHERS*

W. Webster, M.D. C.M.

Anaesthetist to the Winnipeg General Hospital

DURING the past three years two modifications of Anæsthetic Ether, as it was known previously, have been introduced. One by Cotton (1) of Toronto, which goes by the name of "Cotton Process Ether"; the other by Wallis and Hewer (2) of St. Bartholomew's Hospital, London. These new Ethers have come into existence as a result of attempts on the part of their authors to eliminate totally, or at least in part, the discomfort of induction, the disagreeable after effects, and the danger of administration of ether.

Ethyl ether, as prepared for anæsthetic purposes, contains small quantities of impurities, the chief of which are alcohol, water, acetone, mercaptans and thio-ethers. Those formed by oxidation on standing comprise aldehydes, peroxides and acids.

Some years ago Dr. Cotton was led to attempt the removal of all these impurities and finally succeeded in obtaining an absolutely pure ether. He now found to his surprise that this pure ether failed to anæsthetize, even when given in very large doses and for a considerable time. He therefore tried adding certain of the ingredients previously removed and finally evolved the mixture now known as "Cotton Process Ether," which consists, according to the manufacturers, of "highly refined diethyl oxide plus approximately two volumes of ethylene, ½ volume of carbon dioxide and one per cent. by weight of ethyl alcohol."

The claim is made that less of this ether is required, that post-operative vomiting is markedly reduced, that the induction time is shortened, and that an analgesia can be produced which permits of major operative procedures being conducted with a very light degree of anæsthesia, sometimes with the patient only in the "first" stage *e.g.* The following is one case of those reported by Dr. Cotton:

"Case 3. Open mask administration direct from container. Male, age, 18; weight 180 pounds. Operation: adhesions and resection of tubercular mass from abdomen. Time of operation, 1 hour and 10 minutes. Patient remained very clear mentally and cracked jokes throughout. He was given a small meal while the surgeons were operating on him. Abdomen was completely relaxed. Eyes were slightly dilated and pulse remained at 80. Amount of ether used, 3 ounces."

The "Cotton Process Ether" used at the Winnipeg General Hospital was manufeactured by the Dupont Powder Co., and was supplied in ¼ pound tins. When poured into a bottle bubbles of CO_2 gas can be seen rising, very much as from a good brand of champagne. The administrations were mostly by the so-called open method, a mask covered by 15 to 20 layers of gauze (depending on the weight of the gauze). By this method I found, to my great disppointment, that the induction period was, on the average, longer than with other ethers. Often 16 to 18 minutes after commencing induction the patient only reached the second stage of anæsthesia. The excitement period was considerably prolonged.

Given in this manner it is reasonable to suppose that most of the CO_2 escapes and that very little is inspired by the patient. Therefore some administrations were made by the closed method, in which, as with other ethers, a far smaller quantity sufficed. It was also used in a Stock's inhaler, where the anæsthetic is vaporized by the passage of air through the liquid, and also administered with oxygen and nitrous oxide and oxygen.

In a very few cases the operation was conducted with the patient in the second stage of anæsthesia. This, however, can be accomplished in the case of other ethers about as often. Post-operative vomiting, and also the time of regaining consciousness, was about the same as with the ordinary anæsthetic ethers.

Ethanesal is the name given to the new ether produced by Wallis and Hewer. Wallis had unusual opportunities some years ago when in India—where the climate causes rapid deterioration of ether—of testing many samples, and devising means of purifying them. The mercaptans were cause salivation, lacrymation and severe headache. He carried on his experiments until he obtained a pure ether, which he found, as had Cotton, only produced a state of excitement on inhalation, with no true anæsthesia.

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*Read at the annual meeting of the Manitoba Medical

He then tried the addition of ethylene as in Cotton's ether but found it unsatisfactory, and finally added the ketones to the extent of 2 per cent., stronger solutions being found inadvisable.

The advantages claimed for ethanesal are:

1. It is less toxic than chloroform or ether, and the safety margin is greater than with ether.

2. It is less irritating to the respiratory passages than ether.

3. Post-anæsthetic vomiting is less than with chloroform or ether.

4. The taste and smell noticed afterwards by the patient are much less than with ether, and are generally absent.

5. The pulse-pressure is higher than with either ether or chloroform.

Ethanesal has now been used as the anæsthetic in a number of operations at the Winnipeg General Hospital. The odour is less pungent and more fruity than that of ether, and therefore not so irritating to the mucous membrane of the respiratory passages. The breathing is quieter, a light stertor usually being present, much less obvious than that of ether. The after-taste is less persistent and less unpleasant, and salivation is also less than after ether.

The stages of anæsthesia are the same as with ether, but a little shorter. If the operation is extra-abdominal and prolonged, the anæsthesia may—after it has proceeded for some time—be allowed to become very light, the patient, though in some cases blinking his eyes, will remain motionless and apparently without pain.

The pulse rate is less than with ether, in the majority of cases between 80 and 100. The blood pressure is not lowered to the same extent as with ether.

Muscular relaxation is greater, the abdominal muscles in laparotomies relaxing to a degree approximating that produced by chloroform rather than that of ether. The quieter respiration causes less abdominal movement. I have succeeded in obtaining a satisfactory relaxation of these muscles for a surgeon in whose cases I invariably am obliged to have recourse to a certain amount of chloroform, when anæsthetizing with ether for intra-abdominal operations, in order to produce the desired relaxation.

One requires a little practice to get used to this anæsthetic; the tendency being to keep the patient more deeply under it than is necessary. The corneal reflex may be allowed to be fairly brisk in many cases, while the abdominal muscles are still quite relaxed. If not kept under too deeply patients wake up more rapidly than after ether.

The quantity of anæsthetic required is about two-thirds that of ether. Vomiting is generally less than after ether unless the anæsthetic has been pushed to an unnecessary degree. This, in part, may be owing to the rather pleasant odour, the less disagreeable taste left in the mouth after its use, and the lessened salivation.

The age of the patients has varied from 3 months to 70 years. The duration of anæsthesia from 10 minutes to 105 minutes.

The research performed by these workers appears to be of the utmost importance. One cannot expect efforts towards removing the disagreeable and dangerous ingredients contained in anæsthetic liquids to be final as yet. Instead, I think we may look forward, in the confident belief, that we are only at the beginning of an era of chemical research into all anæsthetic substances. The good already accomplished will certainly stimulate those who have so assiduously laboured to lessen the discomfort and dangers, and thereby the fear of anæsthesia; and will doubtless cause others, who have the necessary chemical knowledge, to persevere in the effort to ultimately provide the perfect anæsthetic.

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THE SODIUM CITRATE TECHNIQUE FOR BLOOD TRANSFUSION

Chas. K. P. Henry, F.A.C.S.

Montreal

BLOOD transfusion is so common a hospital procedure that its use in private practice urban or rural, should be extended. Simplicity, and safety of technique is easily acquired, the cost of the necessary apparatus is low, and the outfit obtainable anywhere in Canada.

Chemically pure sodium citrate is readily obtained. We have used Merck's and have taken pains to have it kept covered in its original tin with a glazed paper lining. In the operating room of the Montreal General Hospital we keep on hand corked, small, brown, wide-mouthed glass bottles, each with 18 grains of sodium citrate. The contents of two bottles, 36 grains, are added to 120 c.c. of sterile distilled water at the boiling point and boiled slowly for three minutes,— B . This makes practically a 2.0 per cent. solution. Several ounces of sterile normal saline solution are also needed,—(A). It is desirable to make the solution of sodium citrate fresh for each transfusion rather than keep it any length of time. In country or small town practice where autoclaved solutions are not readily obtainable, the sodium citrate solution may be obtained from Parke Davis and Company in sealed glass ampules of 50 c.c. each, of a 2.5 per cent. solution, sufficient for 450 c.c. of blood. This firm puts up tablets composed of sodium chloride g.m. 2.250, or 34¾ grains, calcium chloride gm. 0.065 or 1 grain, potassium chloride gm. 0.025 or ⅜ grains. Four such tablets are added to 1,000 c.c. of freshly distilled water and filtered through four sheets of white filter paper. This should be well boiled if it cannot be autoclaved, and care taken to see that the original quantity, 1,000 c.c., is not greatly reduced, thereby resulting in a hypertonic salt solution which produces hæmolysis.

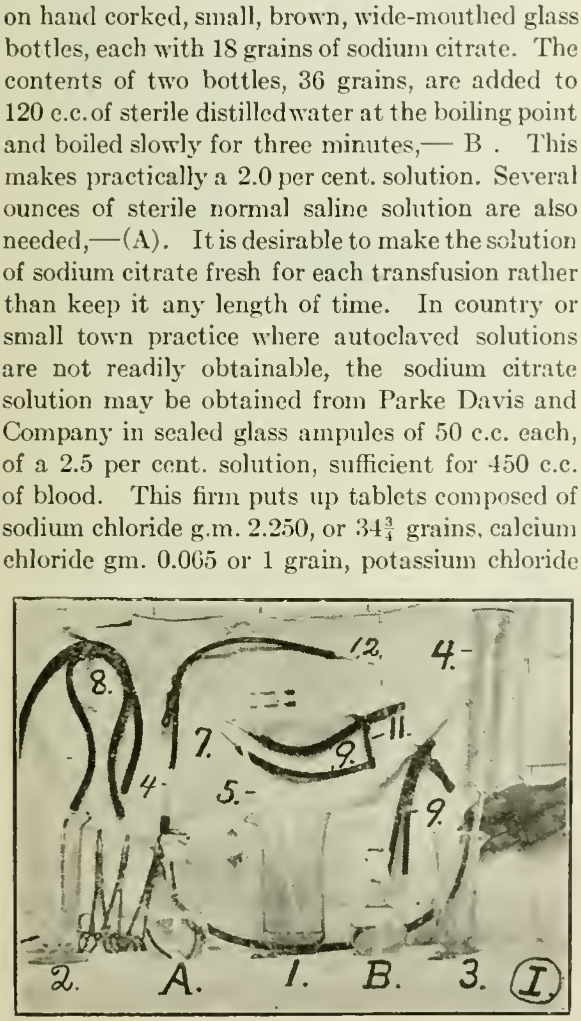


Fig. 1.—Transfusion Set. description by numbered articles in text.

Illustration No. 1 shows that the requirements comprise:

The glassware—

(1) one 500 c.c. conical graduate
(2) one 250 c.c. " "
(3) one 100 c.c. " "
(4) one 300 c.c. infusion container, complete with rubber tubing, glass telltale and record needle connector.
(5) two pieces of solid glass rod, each about 12 inches.

Needles—

(6) two fine cambric straight needles, size 11 or 12.
(7) three large size hollow needles, calibre 12 or 10, bevelled at the end, or any large size Salvarsan needles, for collecting the blood. Satisfactory needles may be obtained by cutting down the large size needles in any aspirating set.
(8) two pieces of rubber tubing, calibre about ⅜ to ⅝ inches, for esmarchs for the arms of the donor and the patient, about 20 inches long.
(9) three pieces of rather firm walled rubber tubing, inside calibre ⅜ inch, each 8 inches long.
(10) four curved, Mayo, hæmostatic clamps.
(11) four or more towel clamps.
(12) assorted sizes record needles for entering the patient's vein.

I have the end of the infusion tubing terminal to the telltale fitted to a metal tip which readily slips into the record needles used for the patient.

All the apparatus and a hypodermic syringe is sterilized by boiling 15 minutes, or in an autoclave, except the needles which are placed in an alcoholic lysol solution, 1 in 12, for 20 minutes. Some 2 per cent. novocaine solution is also needed, and a quantity of sterile water to flush out the needles and tubing prior to beginning the operation.

The operator and assistant, or nurse, should wash up as for a major operation. The arm of the donor and of the patient is prepared by washing with ether, alcohol and alcoholic bichloride 1 in 500, or iodine if the veins are large and easily seen. They are suitably draped with sterile towels held by clips.

Two needles are selected, suitable for the vein of the donor, which is preferably the largest at either elbow, and two pieces of rubber tubing slipped over their ends. After flushing with sterile water or saline they are filled with a little of the citrate solution by making a U of needle and tubing, and when full a clamp is affixed to the end of the tube. This keeps the needle and tube filled, and when the blood flows through, it comes in contact with a citrated surface. 30 c.c. of the 2.0 per cent. citrate solution (or 25 c.c. of the 2.5 per cent. solution) are measured out into the 500 c.c. glass graduate, and another 30 c.c. is left ready in the 100 c.c. graduate. The former is placed on a stool adjacent to the donor's elbow so that when the needle is introduced into the vein the blood will flow directly into the citrate solution and not on to the side of the graduate. The esmarch encircles the upper arm not too tightly, its ends are held by a clamp. Over the course of the vein selected two drops of a 2 per cent. solution of novocaine are injected by a hypodermic at a level half an inch proximal to the point of intended entrance into the vein of the collecting needle. The latter is then inserted through the area of anæsthetized skin, pointing towards the hand, and the clamp removed from the tubing. The assistant holds this directly over the citrate in the graduate and the operator pushes on the needle into the vein, when the blood displaces the citrate and runs in a steady stream into the container. (Illustration No. 2). Steady contraction of the donor's fist maintains this. When 250 c.c. of the mixture is in the graduate another 30 c.c. of the citrate solution (or 25 c.c. of the stronger solution) is added, and the flow continued until the 500 c.c. mark is reached. (Illustration No. 3). If more is required, 30 c.c. of the citrate is added to the 250 c.c. graduate and it is filled to this level. During the flow the mixture is gently stirred with a glass rod. The clamp is removed from the esmarch, the needle withdrawn and collodion or a gauze pad and a bandage applied. The procedure is then reversed. (Illustration No. 4). An esmarch is applied to the patient's arm, the skin anæsthetized, and a suitable record needle selected. It is introduced towards the body and as soon as the blood flows the connecting end of the infusion set is pushed into it and the esmarch removed. The infusion graduate with the tubing previously has had put into it about 25 c.c. or 50 c.c. of saline, all air replaced and clamped. The clamp is removed and it is made certain the flow is established into the vein before adding the blood mixture to the container. The latter is run in slowly, taking at least 10 minutes for 500 c.c.

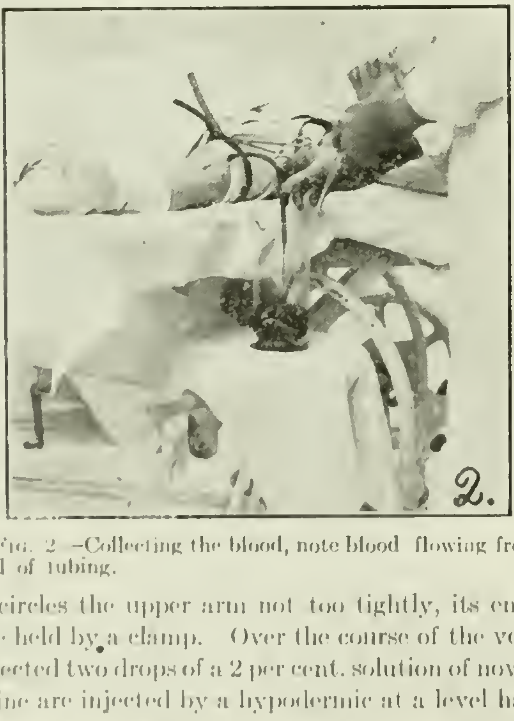


Fig. 2.—Collecting the blood, note blood flowing from end of tubing.

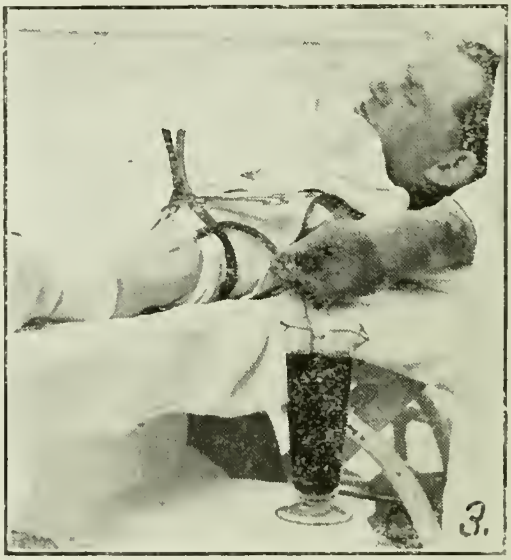


Fig. 3.—500 c.c. blood collected, tube pinched shut by operator.

Too rapid flow will produce cramps in the legs and back and often symptoms of right-sided cardiac engorgement. When it is difficult to locate an obvious vein in the patient's arm, a non-visible but palpable one, after the esmarch is applied, may be secured by Watson's method of transfixing the vein at right angles with a fine cambric needle distal to the proposed point of entrance. This fixes it so that it cannot roll away from the needle.

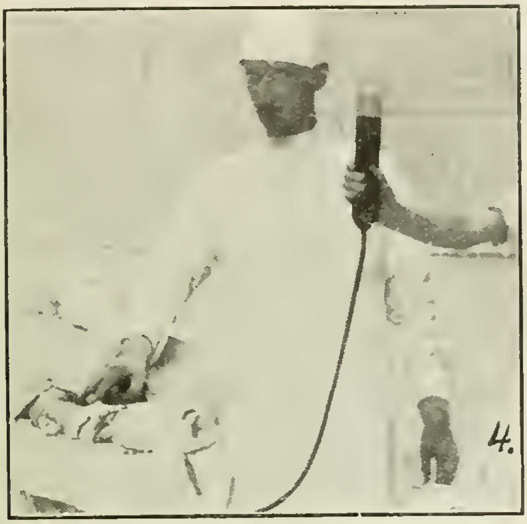
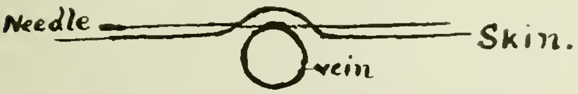


Fig. 4.—Infusion into Patient.



Transfixation of vein.

To flush in the last of the blood mixture, saline is added to the container as it is emptied of blood.

This method is practically identical with that described by Richard Lewisohn (1) and used at the Mayo Clinic and elsewhere. Our modifications are the use of larger needles for the donor's vein and the filling of the needle and tube with citrate solution to lessen the chance of preliminary clotting.

The main difficulties met with are those due to failure to secure an uniform flow from the donor. This is usually due to a too tight esmarch or to failure to enter the vein completely. Occasionally the needle lies against a valve and movement in or out a little, or rotation, re-establishes the flow. In the case of a patient with small veins, fat arms, or marked anæmia, or with some females, it may be necessary to dissect out a vein. I never undertake a transfusion in hospital, or in a private house, without the necessary instruments for such dissection. Only once have I found it necessary to dissect out the vein of the donor, in the case of a very fat man with small veins. In many cases I have found more suitable veins in the lower extremity; the internal saphenous vein, or even varicose veins may be used. In about one dozen transfusions I have used the external jugular vein. In infants the superior longitudinal sinus may be entered, as described by Tarr (3) and others.

The technique of the necessary blood grouping may be easily acquired, and when laboratory facilities are not available, the operator may secure from Parke Davis and Company (Bio. 131) ampules of number two and three group sera, with which a macro- and microscopic test may be carried out. No transfusion, save in the most urgent emergency, should ever be executed without securing a donor either from the same blood group or a universal donor, one from group No 4.

The grouping is described in many articles in the literature. (2) (5). The indications for transfusion, the reactions and results are reported elsewhere by the author (4).

By this method the author has carried out transfusions in hospital or in private homes with equal safety and satisfactory results. The method is now used by other members of the staff of the Montreal General Hospital and has entirely superseded the Kimpton-Brown-Vincent paraffined tubes and the Robertson-citrate bottle apparatus. One of its greatest advantages is that donor and patient do not have to be together and the blood mixture may be transferred to the patient's bedside and even kept several hours. It is not usually necessary to warm the blood mixture, but if left standing any length of time it is advisable to stand it in warm water. Cold intravenous solutions are not well tolerated, and in cases of marked shock or severe hæmorrhage care should be exercised to see that the inflow is at, or slightly above, normal body temperature.

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HOUR GLASS STOMACH*

A. Moir, M.R.C.S. Eng., L.R.C.P. Lond.

Peterborough

THE term "hour glass stomach" has been applied to that condition in which the cavity of the stomach is divided into two or more parts, and refers to the shape of the stomach, rather than to the pathological condition on which the deformity depends. It is really an end result and not a diseased condition in itself.

The condition was first accurately described by the Italian anatomist Morgagni, about the middle of the eighteenth century. He considered the condition secondary to ulcer. He found ulceration present in his cases and considered the deformity to be due to cicatricial contraction of the stomach wall. Monroe, in 1813, reported a series of cases collected from the statistics of various observers.

In 1851, Struther advanced the view that there were two forms of hour glass stomach, the one congenital, and the other acquired, the latter being due to cicatricial contraction following ulcer. Hirsch, a few years later, made a careful study of all the cases reported and came to the conclusion that all cases were congenital, and were due to a congenital deformity. In the cases in which ulcer was found, he considered that the ulceration was secondary, and due to erosion of the stomach wall by the decomposing stomach elements. This view was supported by the fact that in some cases obstructive symptoms dated back to early childhood, while the symptoms of ulcer were of later occurrence. For some years, this theory was looked on as the correct one, but more recently the tendency has been to discard the congenital theory, and to look upon ulceration as the chief cause of the deformity. (1) Moynihan was one of the first to support the ulcer theory, and pointed out the fact that if the condition were a congenital one, it should be found more frequently in the dissection of newly-born children. (2) Rovsing calls attention to the fact that hour glass stomach occurs much more frequently in women than in men, while ulceration is as frequent in men as in women. Rasmussen probably had this in mind, when he advanced the theory of tight lacing as a cause, claiming that the pressure produced a cicatricial shrinkage of the serosa. Rovsing believes that corset pressure is an important factor in the cause of this condition, but claims that the effect of pressure is not to produce a cicatricial shrinking of the serosa as claimed by Rasmussen, but rather to induce fibrous adhesions between the peritoneal folds in the stomach. While this furnishes us with a rather fantastic theory, it does not seem to me reasonable, that in a movable organ like the stomach, and in cases where the corset is only worn during the day, that the folds of the stomach would be in contact sufficiently long to permit fibrous adhesions to form. The natural peristaltic movements of the stomach would also tend to prevent the formation of such adhesions, and further the appearance of the stomach itself, when the abdomen is opened, so far as I know, will not support such a view. While the various theories, stated above, are interesting as a matter of history, I think all observers at the present day are pretty well agreed that ulceration is by far the most common etiological factor. (3) Dr. Eusterman in a paper read before the Minnesota Pathological Society in 1913 stated that up to that time in the Mayo Clinic, over 85 per cent. of hour glass stomach cases were shown to be due to chronic gastric ulcer.

It is quite possible that in those cases formerly looked upon as congenital, a more careful examination would have revealed the presence of present or past ulceration. The fact that ulceration has been demonstrated to be present even in prenatal cases strongly supports this view.

Other etiological factors are:

1. Syphilis of the stomach.
2. Tuberculosis.
3. Swallowing corrosives, either alkaline or acid.
4. Pressure from extra gastric benign growths.
5. Malignant disease.
6. Perigastric adhesions.
7. Constricting bands.

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*Read before the Ontario Medical Association, Niagara Falls, May-June, 1921.

8. Spasmodic contraction, which may be secondary to intrinsic gastric lesions, or to pathological conditions in remote organs, more especially the appendix, duodenum and gall bladder.

Syphilis of the stomach is undoubtedly a more common cause of stomach trouble than we used to think. While I cannot speak of this condition from my own experience, a review of the literature would lead one to believe that it is not an infrequent cause of hour glass deformity, and no discussion of this subject would be complete without reference to it. Syphilitic hour glass stomach may result either from luetic ulceration or from the formation of gummæ. The former will resemble simple ulceration, while the latter will resemble, and might easily be mistaken for, carcinoma. (4) Dewis has called attention to certain features of the *x*-ray appearance of syphilitic hour glass, which he thinks serves to differentiate it from the hour glass of simple ulcer or carcinoma. He says: "In syphilitic hour glass of the stomach we see a long regular isthmus, at each end of which the walls of the stomach rise more or less abruptly or dumb-bell like. This is in sharp contrast to the sharp incisura of simple ulcer hour glass, with practically no isthmus, and the picture differs quite as much from the cancer hour glass with the infiltrated walls of the stomach sloping irregularly away from the constricted portion." Other observers, notably LeWald and Carmen, have called attention to this characteristic pointed out by Dewis.

Several other points may serve to distinguish syphilitic hour glass from that due to carcinoma, viz., in the first place the syphilitic condition is likely to occur at an earlier age—there may be a history of infection—and the general condition of the patient is likely to be much better in the syphilitic condition than in a case with the same degree of deformity, due to cancer. In any case, however, before a positive diagnosis of syphilis is made, the history should be carefully gone over, a thorough clinical examination made and the results co-related with the laboratory and *x*-ray findings. The effect of anti-luetic treatment will also be of value.

Tuberculous ulceration is, no doubt, responsible for a small percentage of hour glass stomach, and while it may be difficult to be positively certain of the diagnosis without the microscopical examination of the diseased tissue, I think the history taken in conjunction with careful clinical examination, and *x*-ray, not only of the stomach but of the lungs, will often make the diagnosis reasonably sure, as the following case will serve to illustrate:

Mrs. K, aged 55 years, widow, with well-marked family history of tuberculosis, had suffered more or less from cough for over twenty years. Examination of the chest showed definite involvement of the upper lobes of both lungs, with the tubercle bacillus present in the sputum. For fifteen years she had suffered from stomach trouble, which was very suggestive of ulceration. During the three years that she was under my care, I noticed that while the gastric symptoms would improve for a period of several months at a time, they would never entirely disappear, and practically every time she contracted a fresh cold and had a flare-up of the lung condition, it would be followed by an aggravation of her stomach symptoms and on at least three occasions, she vomited quite large quantities of blood. *X*-ray examination of her stomach on two occasions revealed a well-marked hour-glass deformity, about the junction of the mid and upper third. I always felt this case could be classed as one of tuberculous ulceration.

The hour-glass of malignant disease is not usually hard to detect. By the time this deformity occurs, a tumour can usually be felt, the patient will be of the cancer age, and there will generally be well marked clinical evidence of malignant disease, such as loss of weight and strength, anæmia of a secondary type, blood in the stool and more or less general cachexia. Examination of stomach contents will show a diminution or absence of free acid more frequently than in hour glass of other types. *X*-ray examination of these cases is usually fairly suggestive. The constricted portion is usually longer than that of simple ulcer, and is frequently more or less irregular in outline. In other words, it is more of a filling defect than a constriction of the stomach wall.

Benign tumours may produce similar deformity of the stomach, but they are comparatively rare, and the indentation produced by them tends to be more regular in outline than is the case with malignant conditions. The following case illustrates this type:

Mrs. T., aged 35 years, married, previous history negative until three months previous to consulting me. Since that time she had suffered more or less continuously from nausea and vomiting. Interrogation elicited the fact that she had not menstruated for three months, and on examination, I found that she was about three months pregnant. On further examination, I discovered a tumour in the epigastrium, about the size of a large orange. It was regular in outline, fixed, and only slightly sensitive to pressure. *X*-ray examination showed a well-marked hour-glass deformity, which was clearly due to the presence of the tumour. The stomach was fixed in the region of the tumour, and the deformity could not be materially changed by pressure on the abdomen under the screen.

On opening the abdomen, I found the stomach itself apparently normal, but attached about the centre of the greater curvature and by its posterior surface to the tumour, which was situated above the pancreas and behind the peritoneum. I opened into the lesser peritoneal sac, by going through the gastro-colic omentum about an inch from the greater curvature of the stomach. I then opened through the posterior layer of peritoneum and came down on a definitely encapsulated tumour, which was enucleated without difficulty. Unfortunately I did not have a pathological examination of the specimen made, but on section it resembled very closely a uterine fibroid. At all events, it must have been a benign growth, for that is now over three years ago and the patient went on to full term, was delivered of a normal baby, and is still perfectly well.

Perigastric adhesions and constricting bands are responsible for a small percentage of hour-glass stomachs.

About five years ago, I removed the appendix from a young girl who had suffered for some months from what I considered to be a sub-acute appendix. For a time, after the operation, she seemed to improve but never got as well as I thought she ought. She still suffered a good deal from nausea and pain in the epigastrium, especially after food. Owing to the fact that she had a very nervous temperament, I attributed her symptoms largely to her nervous condition. The symptoms, however, gradually grew worse and she began to vomit. As her tonsils were not healthy, I thought they might be the cause of her trouble, and had them removed While she was benefited in a general way by the removal of her tonsils, the gastric symptoms did not improve, but the nausea and vomiting gradually increased, until she vomited after practically every meal. I then *x*-rayed her stomach and found a well-marked hour-glass deformity, with a very active antiperistalsis in the upper loculus. I advised her to be examined by Dr. Neal, and he found the same condition present. We advised operation, to which she agreed, and I operated in April, 1920. At operation, we found a dense band of omentum passing from the stomach down to the old appendix scar, to which it was firmly adherent. It was quite clear that this was responsible for the stomach deformity as everything else was quite normal. We separated the adhesion and closed the abdomen. She has been practically free from vomiting since, has gained several pounds in weight, and *x*-ray examination about two months ago showed her stomach to be functioning in a perfectly normal manner.

In the cases mentioned thus far, however, there is not much danger of making an error in diagnosis. It is in the cases associated with spasm or entirely due to spasm that we are much more likely to be led astray. It has been pointed out by many observers that spasm may be present, in greater or lesser degree, in almost any case of hour-glass due either to ulcer or carcinoma. It is a matter of common observation among surgeons that the indentation as seen in the *x*-ray plate or with the fluoroscopic screen, is very much greater than that seen on the operating table. This is due to the presence of spasm during the *x*-ray examination, which disappears under the influence of the anæsthetic. This, however, is not a matter of concern to either the radiologist or the surgeon, for it does not in any way affect the subsequent treatment of the case.

It is in the cases of hour-glass, due entirely to spasm, the result of extra-gastric lesions, and in which the stomach itself is healthy, that the greatest skill will be required in diagnosis. The deformity in these cases may be quite as great and resemble almost perfectly that produced by gastric ulcer, but if the condition is constantly kept in mind, and sufficient patience and care are exercised in diagnosis, it will generally be possible to differentiate the two conditions by the following means.

1.—Hour-glass due to extra-gastric lesions is not likely to be so constant and may vary during palpation of the stomach behind the fluoroscopic screen. These cases should always be screened, both in the vertical and horizontal position, for although the deformity may not entirely disappear, sufficient difference in appearance will often occur between the two positions to make the diagnosis of spasm reasonably certain.

2. It may differ considerably when examined on different days.

3. It may disappear when belladonna is given to the physiological effect. These three tests, I

think, will serve to eliminate the cases secondary to disease of the gall bladder or chronic appendicitis, but (5) Carman, in a paper which was published in *Surgery Gynecology and Obstetrics* in 1918, while speaking of gastric spasm associated with duodenal ulcer, says: "The spasm ranges from moderate incisura to a pronounced contraction and tends to persist after full doses of belladonna have been given, so that the observer is inclined to attribute it to a gastric lesion. The picture is further complicated by the fact that a duodenal ulcer and a gastric ulcer may occur in the same case. In every instance of suspected spastic hour-glass, it behooves the examiner to confirm or exclude the presence of duodenal ulcer. If an ulcer is present as shown by constant distortion of the duodenal bulb, the presumption is strong that it is the cause of the gastrospasm, although careful search should be made for the niche of a gastric ulcer. If no duodenal ulcer is found and the gastrospasm withstands all eliminative tests, the spastic condition is probably of intrinsic origin, thus indicating a lesion within the stomach even though it cannot be seen."

He also points out that if reliable results are to be obtained from the administration of belladonna in these cases it is absolutely necessary to push it until the physiological effect is produced as evidenced by dryness of the throat and dilation of the pupils, there is no doubt that failure in this respect may account for the conflicting opinions regarding the efficiency of the drug in these cases. It will be easily seen that unless this point is observed with the greatest care, the surgeon may ofttimes be led into grievous error.

The symptomatology of this condition may vary considerably. It seems to occur more frequently in women than in men, and there is very frequently a history of gastric disturbance, more or less typical of gastric ulcer, extending over a period of years. Epigastric pain is a common symptom, and may occur shortly after food or be delayed until towards the close of digestion. In some cases I have seen it is not so much a pain as a distressed feeling in the epigastrium, which the patient finds hard to describe. Vomiting may be an early symptom, and is invariably present in the later stages when obstructive symptoms develop. If the constriction is near the cardiac end of the stomach, the symptoms will resemble closely stricture of the lower end of the œsophagus, whereas in cases where the constriction is situated near the pylorus, and the lower loculus is small, the symptoms will resemble those of pyloric obstruction. In the cases secondary to extra-gastric disease, such as chronic appendix, cholecystitis or duodenal ulcer, the symptoms will chiefly be those of the associated lesion, to which will be added symptoms of obstruction, usually of the pyloric type.

Treatment of the condition irrespective of cause, is surgical. Even in those cases not associated with gastric disease, little can be accomplished by medical treatment. If due to a chronic appendix, it must be removed. If the gall bladder is the offending organ, it must be removed or drained, and if duodenal ulcer is present gastro-enterostomy is indicated.

In considering the surgical treatment of those cases due to organic disease of the stomach itself, the close relationship which exists between chronic ulcer and gastric carcinoma must be constantly borne in mind. Judging from the reports of different well-known pathologists, there is no doubt that from fifty to seventy per cent. of cases of cancer of the stomach give an antecedent history of ulcer, extending over a period of years. On account, therefore, of the frequency with which chronic ulcer tends to become cancerous, it is only logical to conclude that the aim of any surgical procedure should be to remove, if at all possible, the pathological tissue. For this reason such operations as gastroplasty and gastrogastrostomy are not to be recommended. Simple dilatation of the constriction, while it does not remove the pathology, may be justifiable in a small percentage of cases where, on account of the numerous adhesions present, it is almost impossible to do anything else. Gastro-enterostomy may be condemned on the same grounds, but while it does not remove the pathology, it does change the chemistry of the stomach, and probably in this way renders the development of cancer less likely. There is a small percentage of cases in which I think gastro-enterostomy is the operation of choice as the following case will serve to illustrate:

Miss E. J., aged 20 years: family history—father was suffering from an inoperable carcinoma of the stomach. He had been treated for ulcer of the stomach for seven years before a definite diagnosis of cancer was made.

Personal history—in 1910 she had an attack of stomach trouble which lasted two weeks, during which time she vomited a great deal. From that time until January 1, 1916, she suffered from occasional attacks of pain in the epigastrium with a varying degree of vomiting and the passage of dark stools. For the first week in January, 1916, she vomited almost continuously. I *x*-rayed her stomach and found an hour-glass contraction with a large cardiac loculus and a small but definite pyloric loculus. I operated on her on January 13, 1916, and found a large saddle ulcer of the lesser curvature about two inches from the pylorus, and the stomach, in that area, bound down with very dense adhesions. Owing to the fact that it was impossible to remove the ulcerated area without doing a more extensive dissection than I considered the condition of the patient warranted, and also on account of the fact that the pyloric loculus was so small as to be practically negligible, I considered a posterior gastro-enterostomy with the upper segment of the stomach to be the best procedure and did so with gratifying results. The last report I had from her was two years after the operation, and at that time she was thirty pounds heavier than before operation and had not had any trouble since operation. While a gastro-enterostomy does not remove the pathological condition, I think in such a case as the above, it is the wisest course to follow.

But it is in those cases in which the lesion is situated in the central third of the stomach and in which the loculi are of nearly equal size, that one is able to get the best results from surgical treatment. It was in this type of case that the operations of gastroplasty and gastro-gastrostomy were advocated a few years ago, but Moynihan in speaking of these operations says: "In many of the recorded cases, there was recovery without relief." This is only what we might expect for the pathological condition is not removed and the chemistry of the stomach remains unchanged. In gastro-enterostomy, on the other hand, while the affected part is not removed, the chemistry of the stomach is changed, and on this account we are likely to get more or less relief. The operation of choice, however. is a partial resection of the sleeve type. This operation can be done in the same time and with as little shock as the operations just referred to and at the same time it has the decided advantage of removing the diseased part and with it the danger of the development of carcinoma at a later date. In all these cases the possible presence of associated lesions must be kept in mind, and in all those cases in which duodenal ulcer is present as well as the hour-glass deformity, a gastro-enterostomy must be done in addition to the partial resection. The following case will serve to illustrate:

Miss S., age 55 years.—Had enlarged tonsils and discharging ears in early life. Teeth were also very poor. Twenty-one years ago began to suffer from attacks of water brash with pain and vomiting, which would last from two to three days to two or three weeks. Would then go from six to eight months perfectly well. Noticed that the attacks had a tendency to come on in the spring, and fall. Had tonsils and teeth removed twenty years ago, but still continued to have attacks as before. For the last ten or twelve years she had more or less trouble the greater part of the time. For the last two years has had constant distress, vomited a great deal, especially at night. To use her own expression "She wondered where it all came from." Her normal weight was 125 pounds, her weight before operation was 110 pounds; hæmoglobin 60 per cent. She had also lost a great deal of strength, was quite anæmic, her red blood count being only 3.200000. On physical examination there was a marked tenderness in the epigastrium but no tumour could be felt. *X*-ray examination revealed a typical hour glass deformity of the B type with a perforating ulcer on the lesser curvature situated a little nearer the cardia than the pylorus. There was also a deformity of the duodenal cap. I operated on her on March 5th, and found the condition of the stomach referred to above; there was also a duodenal ulcer which was producing obstruction of the duodenum, and her appendix was bound down by adhesions, the gall bladder was normal. I removed the constricted portion of the stomach including the ulcerated area, and about one inch of the stomach wall on each side of the constriction. I then united the cut ends in the usual way. Owing to the fact that she was suffering also from a stenosing duodenal ulcer, I did a posterior gastro-enterostomy attaching the loop of the jejunum to the posterior surface of the lower half of the stomach. She left the hospital in less than three weeks, taking almost full diet without any discomfort. This case illustrates very well the necessity in all cases, not only of careful examination of the stomach itself, but of making careful search for associated lesions in other organs, especially the appendix, gall-bladder and duodenum. It also suggests very forcibly the causal relationship between the infected teeth and tonsils and the stomach lesion.

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TWO CASES OF SUPERNUMERARY URETERS OPENING INTRAVESICALLY*

H. I. Palmer, M.B.

Late Resident Pathologist, Hospital for Sick Children, Toronto

In 1918 Mertz (1) extensively reviewed the subject of multiple ureters, having collected 300 cases from the literature and contributed 16 additional cases. Since that time Judd (2) has reported a case opening extravesically ,and Wilhelmj (3) a case opening intravesically.

In 278 of the 318 cases the type of anomaly was stated, there being 63 of unilateral partial duplication, 9 of bilateral partial duplication, 141 of unilateral complete duplication, 50 of bilateral complete duplication, and 14 of bilateral duplication, being partial on one side and complete on the other. I wish to add two cases to the literature, one of unilateral complete duplication, and the other of bilateral duplication, complete on one side and partial on the other.

Embryology

About the end of the first, or the beginning of the second month of embryonic life, a diverticulum arises from the posterior wall of the lower end of the Wolffian duct, close to where the latter opens into the cloaca. This diverticulum or renal bud grows dorsalward and forward along the posterior abdominal wall, where its blind extremity expands and divides normally into two branches, which grow into the blastoma of the kidney. Each branch then divides, and by continued subdivision forms the straight and uriniferous tubules, and calyces of the kidney. The proximal portion of the diverticulum becomes the ureter.

The kidney reaches its normal height about the end of the second month, and then receives its blood supply, the vascularization coming directly from the aorta, and occasionally from the suprarenal artery. The vessels seem to choose the nearest route to the hilum, the branch from the suprarenal sometimes entering the upper pole.

The ureter grows away from the Wolffian duct, and empties higher and more laterally. It assumes its relatively normal position in the same stage in which the kidney reaches its normal height, or about the end of the second month. The two processes are, however, quite distinct, the change in the position of the kidney being due to the development of the distal part of the bud and its surroundings, while the change in the position of the ureter is related to the growth of the lower end of the Wolffian duct.

Pohlman (4) has tabulated the steps in the development of the tract as follows:

(1) The renal bud arises dorsally on the Wolffian duct after the duct has reached the cloaca, and at a short distance from its entrance.

(2) The two buds grow dorsally, lying close together, each being capped with a mass of renal mesenchyme.

(3) Each bud divides into an upper and a lower sprout at some distance from the Wolffian ducts.

(4) The kidney wanders up from a position in front of the second sacral vertebra, rotates at the mid-lumbar region, and finally reaches its normal height about the end of the second month.

(5) It becomes vascularized after it has reached its normal height.

(6) The ureter changes its position on the Wolffian duct from dorsal to lateral, and comes to empty distinct from it.

(7) The ureter loses its relation to the duct entirely, and opens higher and more laterally.

Should the renal bud divide too early, or the division extend into the ureter segment, that splitting found in the ureter itself would remain a permanent one, and any variation might exist as a result, from an exaggeration of the usual upper and lower pelves to an incomplete reduplication of the ureter. An incomplete double ureter may be defined as two ureters with a common orifice.

Should the splitting of the renal bud be so complete that it is affected by the shortening of the segment of the Wolffian duct lying between it and the cloaca, it is possible for each division to acquire a distinct orifice in the duct. This would result in complete double ureter.

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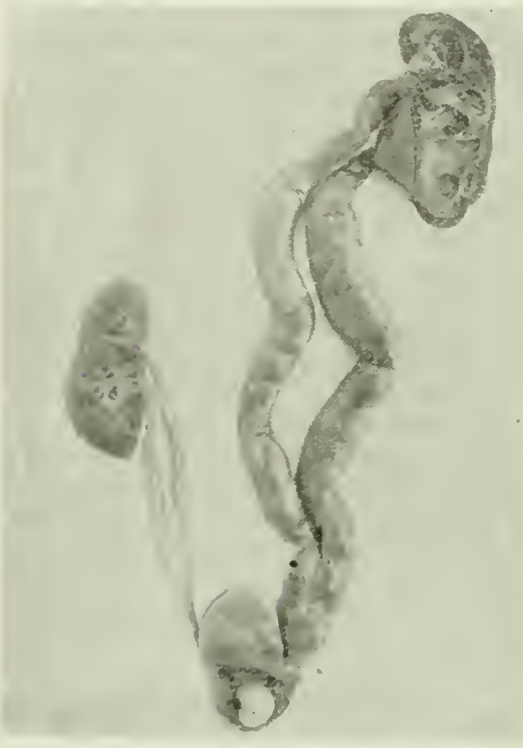
*From the Wards and Pathological Laboratory, the Hospital for Sick Children, Toronto, Ont.

Pohlman has stated rules for double ureters, which hold true with relatively few exceptions. They are as follows:

In incomplete double ureters the ureter from the upper pelvis lis ventral to the one from the lower pelvis, and there is a common orifice into the bladder. In complete double ureters the proximal relations are the same, but as they approach the bladder, the ureter from the lower pelvis swings lateral to the one from the upper pelvis, and empties into the bladder lateral and slightly above it.

Case Reports

Case 1.—E. H., aged four months, admitted with a history of vomiting after feedings since birth; vomiting sometimes projectile in character. The mother had observed that the urine was always scanty in amount. Weight on admission 7 pounds, 6 ounces.



Case 1.—The left kidney has purposely been placed at a much higher level than the right kidney in order to demonstrate the increased length of the left ureters. Probes are shown placed in the common orifice of the ureters of the right kidney, in the orifice of the ureter from the lower pelvis of the left kidney, and in the urethral orifice.

Physical examination revealed a poorly developed, very poorly nourished infant in a state of collapse. The skin was markedly dehydrated, the abdomen lax and scaphoid with visible peristaltic waves; no pyloric tumour felt. The anterior fontanelle measured 3 x 4 fingers, with well-marked craniotabes, and slight epiphyseal enlargement. The external genitalia were normal.

Laboratory report: Urinalysis, acid in reaction, negative for albumin and sugar. Microscopic examination showed enormous numbers of pus cells, and many long chains of streptococci in an unstained smear. R.B.C. 6,000,000, W.B.C. 16,000, with 30 per cent. polymorphonuclears and 70 per cent. lymphocytes. Hæmoglobin 100 per cent., temperature 98.3F. Diagnosis: 1, pyelitis; 2, rickets.

The infant was transfused, and given daily interstitial administration of 5 per cent. glucose solution, the pyelitis being treated with potassium citrate, grains 100 per diem. He succumbed four days following admission.

At autopsy both kidneys were in their normal positions. The right kidney showed remnants of fœtal lobulation. Its greatest length was 5.2 centimetres, and greatest diameter 2.3 centimetres. On section the cut surface appeared to be normal. Two ureters emerged from the hilus, about 1 centimetre apart, from two distinct pelves, and followed a normal general course to the bladder, the ureter from the cephalic pole, 10.5 centimetres in length, lying anterior to the ureter from the caudal pole, 9.5 centimetres in length, and uniting with its fellow about 3 centimetres from the bladder. There was a single opening into the bladder in a normal position in relation to the trigone. Both ureters were slightly dilated, and contained some turbid urine.

The left kidney also showed remnants of fœtal lobulation, but to a greater degree than the right kidney. Its greatest length was 6.4 centimetres, and its greatest diameter 3.6 centimetres. The amount of kidney tissue was very small, being only a few millimetres in thickness. Two distinct pelves were present, as on the right side, but here they were quite dilated, the lower to a much greater degree than the upper. Both ureters were markedly dilated and tortuous, and were filled with a yellowish turbid fluid. The ureter from the caudal pole, 19.0 centimetres in length, lay posterior to the ureter from the cephalic pole, and opened by an apparently normal orifice into the bladder, also in a normal position in the trigone.

The ureter from the upper pelvis, however, 21 centimetres in length, while at first anterior to its fellow, became more medial as it neared the bladder, and penetrated the bladder wall at a point about 7 millimetres lower and more medial than the other ureter. It presented in the bladder cavity as a bean-shaped, cystiform swelling about 1 centimetre in diameter, with an opening in the form of a vertical slit, about 2 millimetres in length, sutiated on the lower part of the posterior wall. When the cyst was distended with fluid from above, it was observed that the slit-like orifice lay against the posterior bladder wall, and that the cyst partially blocked the opening of the other ureter on the same side. It also lay over the urethral orifice at the apex of the trigone.

The bladder contained about 15 cubic centimetres of yellowish turbid fluid, similar to that found in the left renal pelves and ureters, and the bladder wall showed some congestion of the mucous membrane.

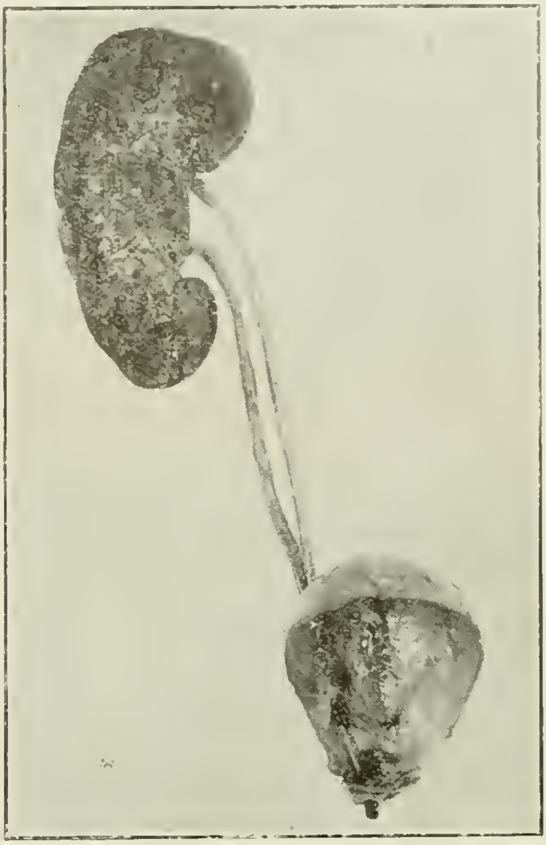
Hæmatoxylin and eosin sections of the right kidney revealed nothing abnormal. Sections of the left kidney showed both the cortex and medulla to be greatly thinned out, with a considerable increase in connective tissue, and infiltration with small round cells immediately underlying the pelvic epithelium. In this region, remnants of tubules could be made out. Some of the tubules were considerably dilated, being lined with flattened epithelium. A few of the glomeruli showed dilatation of the capsular space with fluid, the tuft being compressed to one side. The majority of the glomeruli, however, were normal. Diagnosis: hydronephrosis, with beginning pyonephrosis.

Direct smears of the urine from the bladder showed large numbers of pus cells, and Gram positive cocci in chains; also a few Gram negative bacilli. On culture the predominating organism was a non-hæmolytic streptococcus, with some colon bacilli.

Case 2.—F. W., male, aged 3½ months, with a complaint on admission of frequent green stools with mucus for two weeks. The infant had vomited considerably during the week previous to admission. The vomiting and diarrhœa were sequels to a bad feeding history with artificial foods high in carbohydrates, which need not be gone into detail here.

Physical examination revealed a poorly developed, badly nourished infant in a very toxic state. The eyes were sunken and the skin was markedly dehydrated. Chest and abdomen were negative.

Laboratory report: urinalysis, acid in reaction, a trace of albumen, negative for sugar. Microscopic examination showed a few hyaline casts. R.B.C. 4,200,000, W.B.C. 28,500, with 40 per cent. polymorphonuclears and 60 per cent lymphocytes. Hæmoglobin 70 per cent., temperature 98.0F. Diagnosis—1. Acute intestinal intoxication; 2, Fermentative diarrhœa.



CASE 2.—Probes are shown placed in the orifices of the two right ureters, of the left ureter, and in the urethral orifice.

The feedings were corrected, the baby was transfused, and 5 per cent. glucose solution was administered daily, both intravenously and interstitially. The child seemed to improve, but developed double otitis media ten days after admission, following which his general condition became worse, and he suffered a collapse and died four days later. Five days before death the urine was negative for albumen, and showed no microscopic changes.

At autopsy both kidneys were found to occupy their normal positions. The left kidney, 5.3 centimetres in length, and 2.8 centimetres in diameter, showed nothing abnormal outside of being somewhat congested. From a single pelvis arose a single ureter, 9.5 centimetres in length, which pursued a normal course to the bladder, and emptied by a normal orifice in the trigone.

The right kidney, 5.8 centimetres in length and 3.0 centimetres in diameter, also showed a slight amount of congestion. Two distinct pelves gave rise to two ureters about 1 centimetre apart at their origins. The ureter from the cephalic pole, 9.5 centimetres in length, lay anterior to its fellow, 8.5 centimetres in length, and after following a normal course to the bladder opened by an orifice about 1 millimetre medial and anterior to the orifice of the ureter from the caudal pole. Both ureters were patent throughout their course and showed no apparent dilatation.

The bladder contained about 15 cubic centimetres of clear, amber coloured urine, and its walls showed nothing abnormal.

Hæmatoxylin and eosin sections of the kidneys showed only a slight degree of nephrosis. No glomerular involvement was found.

REMARKS

Thus it can be seen that Pohlman's rule applies also to these two cases, that for incomplete double ureters to the right ureters in Case 1, and that for complete double ureters to the left ureters in Case 1, and the right ureters in Case 2.

Bottomley (5) mentions seventeen cases of ureteral obstruction with cystiform protrusions of the ureter into the bladder, seven of which were associated with multiple ureters, while in thirteen of the cases of ureteral duplication collected by Mertz, a similar condition was present. Johnson's (6) case is specially interesting in that the cyst presented at the vulva. He writes as follows: "The vesical orifice of the right ureter is normal in size and position. From the corresponding point on the left side, a raised column 5 millimetres across, covered by the mucous membrane of the bladder, extends downwards, gradually increasing in diameter, and ending in a bulbous enlargement which, with the parts in their natural position, occupied the whole length of the dilated urethral canal, and protruded externally between the labia. On its posterior surface the bulbous enlargement is attached to the floor of the urethra nearly as far as its orifice. On its right side the enlargement presents a long rent, freely opening the hollow interior, from which the probe can be passed up into the ureter."

In Bottomley's case there was a history of 2½ months' illness from vomiting, diarrhœa and loss of weight as symptoms in a 5½ months infant. His findings were similar to those in Case 1, with the exceptions that in his case the ureters arose from a common pelvis, and the cyst had no opening either into the bladder or into the other ureter, while here there were two distinct pelves and the cyst possessed an opening into the bladder.

According to Mertz there is no pathological process of the kidney, ureter or bladder dependent directly upon the existence of a double ureter nor does he conclude from his study on the subject that there is one type of disease more prevalent in patients with double ureters than in those with no such anomaly, although he quotes one writer as saying that kidneys with double pelves and ureters are frequently affected with calculi. Case 2 demonstrates that the anomaly can exist without giving rise to disease. The hydronephrosis and pyonephrosis present in Case 1 did not depend directly on the existence of double ureters, for such processes are present in a much greater number of patients possessing single ureters.

In the 276 cases of Mertz, disease was stated to be present in 85, or 30 per cent. In 76 of the diseased cases the pathological condition was stated, and of these there were 31 of hydronephrosis and 18 of pyonephrosis.

In Case 1 the obstruction resulting in the hydronephrosis and secondary pyonephrosis may have been due to either of two factors. It may have been caused by pressure of one ureter against the other when they crossed, for it has been observed that stasis is produced in such a case, especially when the ureters are closely bound together. Or it may have been brought about by the cystiform swelling acting as a valve when distended. This was tried out experimentally, it being found that when the ureter with the cystoform ending was filled with fluid at the pelvis with a syringe, no great distension took place at first, the fluid passing readily into the cyst. But when this was filled the ureter dilated, and more pressure was required to force the fluid from the orifice of the cyst. When the other ureter was filled with fluid, while the first was still distended, it was found that resistance to outflow from its orifice was also present. On the right side, fluid passed through both ureters with no difficulty.

Thus the cystiform swelling when distended with urine was responsible for the stasis in both ureters. Its own orifice was pressed against the posterior bladder wall, thus obstructing any outflow from its interior, and also it covered up the opening of the other ureter and blocked the urethral orifice. The latter would result in distension of the bladder, with increased intravesical pressure, which in turn would cause the cyst to increase the existing blockage of the left ureters, and would also cause some obstruction in any outflow from the right side. This latter explains the cause of the slight dilatation of the right ureters.

These two cases were not suspected until autopsy, but as multiple ureters produce no pathological processes directly dependent on their existence, they produce no symptoms and hence cannot be diagnosed by this means. The single ureter with an ectopic orifice produces the same symptoms as an abberant supernumerary ureter with a similar orifice. Cystescopic examination might have revealed the condition in these cases, but as yet it is a procedure not carried out very extensively with infants.

In closing I wish to acknowledge my indebtedness to Dr. Alan Brown, physician-in-chief, for his many valuable suggestions, and for permission to use these records.

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Prevention of Simple Goitre in Man.—The ultimate cause of simple goitre is totally unknown, notwithstanding a relatively large amount of study. The immediate cause is a lack of iodine. The enlargement, therefore, is a symptom and may result from any factor which increases the iodine needs of the organism, as in certain types of infection, or which interferes with the normal utilization of iodine; or it may result from actual experimental deprivation of iodine. After consideration of all the various substances, agents and theories that have been put forward as having a role in the etiology of goitre, David Marine, New York, and O. P. Kimball, Cleveland (Jour. A. M. A., Oct. 1, 1921) state that at present we must fall back on the view that thyroid hyperplasia (goitre) is a compensatory reaction arising in the course of a metabolic disturbance and immediately depending on a relative or an absolute deficiency of iodine. No accomplishment in preventive medicine has a firmer physiologic and chemical foundation than that underlying goitre prevention. As the work of prevention is based on certain of these facts, the more important are reviewed by the authors. A milligram of iodine, given at weekly intervals, has been found sufficient to prevent thyroid hyperplasia in pups. If the iodine store in the thyroid is maintained above 0.1 per cent., no hyperplastic changes, and therefore no goitre, can develop. The method as applied to man consists in the administration of 2 gm. of sodium iodide in 0.2 gm. doses, distributed over a period of two weeks, and repeated each autumn and spring. This amount of iodine is excessive, and far beyond the needs of the individual or of the ability of the thyroid to utilize and store it. One gram distributed over a longer period would be better. The form or mode of administration of iodine is of little consequence. The important thing is that iodine for thyroid effects should be given in exceedingly small amounts, and it is believed that most of the untoward effects recorded are due to the excessive doses employed, or more concretely, to the abuse of iodine. The results of their two and one half years' observations on school girls in Akron are as follows: Of 2,190 pupils taking 2 gm. of sodium iodide twice yearly, only five have developed enlargement of the thyroid; while of 2,305 pupils not taking the prophylactic, 495 have developed thyroid enlargement. Of 1,182 pupils with thyroid enlargement at the first examination who took the prophylactic 773 thyroids have decreased in size; while of 1,048 pupils with thryoid enlargement at the first examination who did not take the prophylactic, 145 thyroids have decreased in size. These figures demonstrate in a striking manner both the preventive and the curative effects. The dangers of giving iodine, in the amounts indicated, to children and adolescents are negligible.

Case Reports

A PSYCHOSIS OF HYSTERICAL TYPE*

C. A. Baragar, M.D.

Superintendent, Brandon Hospital for Mental Diseases, Manitoba.

BILATERAL functional blindness is, I believe, of sufficient interest and rarity to justify the presentation in some detail of a case of hysteria and psychosis exhibiting this symptom.

May N., a Canadian-born girl of seventeen, the youngest of a family of nine and the child of her parents' old age, was admitted to the Brandon Hospital for Mental Diseases on April 29, 1921. Family history was negative, though her father died of cerebral arteriosclerosis a few weeks ago in the same hospital. The patient had always been a nervous child and somewhat spoiled. As a child she was subject to sudden rises of temperature, as high as 105 , without obvious cause. She also suffered from nocturnal enuresis, from which she never fully recovered. She is said to have been of a sunny, sociable temperament, but rather excitable. She was backward in school. Six years ago had "St. Vitus' dance," from which she was said to have recovered in six weeks under "osteopathic treatment." She was under weight until about a year and a half ago, when she became fleshier and at the time of admission weighed 119½ pounds. Menstruation began at the age of fifteen; was regular until onset of present illness and then ceased, but became regular again a few months ago.

Last winter patient became emotional and subject to fits of depression. During January she caught a girl stealing from the pockets of other students, reported it, and as a result was interviewed by the police. Following this incident she worried a great deal and complained of numbness of the hands, particularly the right, and it was noticed that they were "purple". She had several of these attacks, all of short duration. A few days later she imagined that someone was trying to get into the house and would say "He's after me now." One night she thought she saw flashlights and imagined people were reflecting lights on her from mirrors. She improved for a time and then became worse. On two occasions, during the first week in April, she became temporarily blind, once for two hours. On April 7th she received a fright when her father, in a fit of temper and partially dressed, came into the kitchen, and she became suddenly blind again and has apparently not been able to see since. During the following nine days she refused food or water and resisted being fed. She then became ravenous, but owing to her helplessness and blindness, had to be spoon fed. She was unclean in her habits. She was resistive, restless and destructive. Her talk was incoherent and she did not recognize members of her family. It was noticed that she did not use the right side of her body as well as the left. She was admitted to the Hospital for Mental Diseases on April 29th.

Examination showed a well-developed girl, with no physical stigmata. The hands and feet were cyanosed. At first there was a slight systolic murmur at the apex of the heart, without definite enlargement, a sinus arrhythmia and an occasional extrasystole. These have now cleared up. The blood pressure has been 135, to 140 m.m. Hg. A radiogram of the cranium is negative. Laboratory tests, including a blood Wassermann and spinal fluid examinations, were negative.

Neurological examination showed that vision was apparently nil, though the corneal and conjunctive reflexes were present and the pupillary reflexes normal. Examination of the fundi has always been normal. The patient has never injured herself from lack of vision, and at times has been able to walk about a strange room, full of apparatus, without injury to herself. Smell, taste and hearing were apparently normal. There was a general weakness of the limbs. At first the feet were dragged limply as patient stumbled along, and she had to be supported. The weakness of the limbs seemed to be greater on the right side Co-ordination was normal. It was difficult to do a sensory examination, but there was apparently no marked change except for an irregular distribution of analgesia all over the body. The patient was able to endure unusual pressure over the supra orbital nerves, but was quite sensitive to the pain of a lumbar puncture. There were no pathological reflexes. All tendon reflexes were somewhat increased and at times there has been slight unsustained ankle clonus.

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*Abstract of a paper read at the annual meeting of the Manitoba Medical Association, Winnipeg, November 9, 1921

Mentally patient is almost completely inaccessible and un-cooperative. At first she was resistive and irritable, now she is passive and usually placid. At times, however, she becomes angry and scolds when other patients tease or annoy her. She may laugh or cry according to her mood. She was destructive to clothing and bedding. She frequently undressed herself and at times exposed herself to other patients in an erotic manner. She was very unclean in her habits. At first she had to be spoon fed like a child, but now feeds herself. She wanders or sits about the ward quietly, sometimes singing or talking to herself and when addressed often commences patting herself on the breasts or abdomen.

She appears to be more or less out of touch with her environment as to time, place and person, though she responds to her own name, appears to recognize her nurses and at times seems to have some idea as to where she is. There does not appear to be any fundamental memory defect. At first she had delusions of a persecutory trend, which have disappeared. She has evidently a feeling of inferiority or of being like a helpless child. The thought processes show incoherence, slowness of associations, inability to understand, poverty of ideas, sterotypy of words and phrases and an echolalia.

Suggestibility was evident at first in a negative way by resistiveness, but now in a positive way by echolalia and cataleptic attitudes.

We have here a young girl of neurotic personality as shown by the nocturnal enuresis, the chorea and the excitability, who was passing through the critical period of adolescence. Following certain mental shocks she develops sensory disturbances, a variable analgesia, an apparent weakness of the limbs most marked on the right side, and a sudden loss of vision, all without organic neurological signs.

The patient, mentally, passes through a stage of mild delusions and visual hallucinations, resistiveness and irritability to an apparently demented condition characterized by incoherence of speech, poverty of ideas, apparent disorientation, catapeltic phenomena and indifference to personal habits.

There is no evidence to indicate organic lesion of the nervous system. Treatment so far has produced very little in the way of result, although there has been considerable general improvement in her adjustability to environment, but this is very far from recovery.

In conclusion, therefore, we have here a patient exhibiting hysterical phenomena in the physical field, the most interesting of which is that rare condition, a complete functional blindness, and in the mental field a psychosis characterized by delusions and simple visual hallucinations at first, but later by an apparent dementia with inaccessibility, defective contact with environment, undue suggestibility somewhat similar to catatonia, but differentiated by a peculiar variability of depth—a psychosis of hysterical type.

Intestinal and Hepatic Reactions in Anaphylaxis.—The anaphylactic reaction in guinea pigs and dogs, W. H. Manwaring, Stanford University, California (Jour. Amer. Med. Assoc., September 10, 1921) says, is characterized by the explosive formation or liberation of smooth muscle relaxing substances by the hepatic parenchyma. These substances are directly responsible for the hepatic vasodilatation in dogs, and either directly or indirectly responsible for the general vasodilatation. In guinea pigs, these substances act as an antianaphylactic mechanism, tending to overcome the initial bronchial and vascular spasms or to prevent these spasms if the protein injections are made by way of the mesenteric veins. The chemical nature of these smooth muscle relaxing substances is unknown. There is no reason, at present, to believe that they are antibodies. There is evidence that they are not cleavage products of the specific foreign protein. In dogs, there is evidence that the hepatic reaction is secondary to a preliminary serum reaction. The hæmorrhagic intestinal lesion in dogs is a secondary phenomenon, due to the local action of intestinal enzymes.

Retrospects

THE TREATMENT OF CHRONIC NEPHRITIS

A. H. Gordon, M.D.

Montreal

As an introduction to, and a summary of, the method of management of renal disease based upon the study of the body chemistry, one reverts to Janeway's article in the *American Journal of the Medical Sciences*, February, 1916.

His views in the main still hold good, for example "I say 'practical management of the patient' because except in the rarest instances we have no real treatment of the disease"; or again: "Improved methods of investigation make possible the more exact adjustment of treatment to the needs of the individual case, and the relief of the patient from unnecessary restrictions.

"In spite of all this, it brings us not one whit nearer the real goal of treatment, prevention or cure of the disease.

"If we ever achieve that, it will be through new knowledge of the causes of these obscure but frequent affections, and every attempt to approach this problem from a new viewpoint should be enthusiastically welcomed by every medical man."

1.—Excepting postural albuminuria and residual albuminuria after acute nephritis, there is a large group of cases showing albumin and casts as the only evidence of impairment.

In these, safeguarding treatment only, is indicated. Severe physical strains, over-eating, the consumption of creatinin in soups, meat extracts, etc., the abuse of condiments and alcohol, and excessive salt intake, are to be avoided.

2.—Albuminuria with hypertension, with slight subjective symptoms. Here, too, safeguarding treatment is necessary, consisting of the avoidance of all blood pressure raising influences, insistence upon a break in the middle of the day for rest, but except in rare cases permission for a man to continue at his business.

More exercise than is ordinarily permitted; insistence upon physiological economy in nutrition, and limitation of the salt and fluid intake; and when possible a winter residence in a warm climate.

3.—Hypertension with outspoken myocardial insufficiency—the common type of chronic Bright's disease. These cases present the problem of the treatment of a circulatory disease, and both safeguarding and symptomatic treatment are necessary.

It is here that the nephritic test meal, and the phenol-sulphophthalein test are of great value in differentiating the essentially renal from the principally cardiac symptoms.

The chronic passive congestion of the kidney of cardiac origin tends to retain salt and encourage œdema.

Effective digitalization for the auricular fibrillation accompanying this type is necessary, and even the cases without fibrillation but with œdema and congested liver will often react to digitalis, though sometimes they will not.

Following a Mosenthal test meal, the greater the contraction of the kidney the more will the specific gravity of the two-hour specimens of urine tend to be constant at a low level, and the greater will be the nocturnal polyuria and the less the nitrogen concentration in the urine.

The strict limitation of the salt and water of the food is essential in chloride retention, and the presence of a high figure for blood nitrogen on chemical examination of the blood calls for radical restriction of the proteid intake down to approximately 30 gm. of N. daily.

The Karell diet—the administration of 800 c.c. of milk as the total daily intake—long employed empirically, is an ideal method for rigorous restriction of salt, water and proteid.

4.—General œdema without notable myocardial insufficiency. This group may include such conditions as protracted acute nephritis with a good prognosis, amyloid disease, and degenerative affections of the tubular epithelium.

These cases all show marked salt retention in the test meal, while the phthalein test and the nitrogen excretion may be normal. Purgation, sweat baths and radical salt restriction are indicated. Some of this group may pass into the next.

5.—Advanced renal insufficiency with uræmic symptoms. Retinal changes are usual. The renal test meal shows a fixation of the specific gravity of the urine at a low level, both nitrogen and salt concentration are reduced and the phthalein test shows low readings in advanced cases mere traces, and the Ambard coefficient is uniformly high.

In Janeway's words "treatment of the severest renal insufficiency is purely symptomatic and is not a cheerful duty."

The distress of breathing requires relief for which chloral with or without bromides may be tried, but for many morphine alone is effective.

Patients should be encouraged to sit up and a vasodilator on retiring may be useful.

Diet is limited by the patient's incapacity to take food. Bleeding followed by transfusion has given symptomatic improvement, and injection of corpuscles from centrifugated blood has been tried.

For convulsions, bleeding of 500 to 600 cc. is indicated.

It is essential that one pay attention to the element of myocardial inefficiency, which in its turn adds by passive congestion to the burden of the damaged kidney.

The same holds true in regard to obstruction in the urinary tract which by back pressure diminishes the secreting power of the kidney, and surgery may at times render medical treatment superfluous. After all is said, however, treatment of severest renal disease is often ineffectual and becomes a problem in the choice of sedatives

The surgical treatment by decapsulation was seen to yield good results in two cases and failures in a number.

Christian (*J.A.M.A.*, vol. 74, No. 24) points out three aims in the treatment of chronic nephritis: (1) To stay the progress of the lesion. (2) To remove œdema if present. (3) To prevent production of toxic substances.

To stay the progress of the lesion, all foci of infection are removed, but the kidney damage is already done, and too much cannot be expected from this source.

To decrease renal work, the diet is limited, but there is still little real knowledge as to the optimum proteid, salt, and water intake, and careful observation of a large number of cases over a period of years is necessary to furnish this knowledge.

The removal of œdema.—We are still in the dark as to the essential cause of œdema and therapy contents itself with the limitation of salt and water intake, and increasing elimination, but frequently the kidney elimination of salt and water is at such a low level that limitation of intake cannot overtake it.

True renal œdema is not affected by diuretics.

Prevention of toxic effects.—There is evidence that low protein feeding diminishes the tendency to the formation of toxic substances, and their elimination may be assisted by purgation, sweating by diuresis and mechanically by bleeding.

Barker (*ibid*) advises for the prevention of nephritis "To keep every patient with tonsillitis in bed till the throat is well, to take care of abscessed teeth and to keep patients from becoming overweight."

Janney (*ibid*) warns against too great restriction of protein and increase of carbohydrate and fat in the diet, leading to obesity and weakness.

In the same discussion Christian suggests in the absence of an etiological classification that nephritis be classified as (a) Acute nephritis (b) Chronic nephritis with œdema (c) Chronic nephritis without œdema (d) Subacute nephritis.

Epstein (*Amer. Jour. Med. Sci.*, vol. cliv, No. 1) describes a type of renal œdema or nephrosis, degenerative in character, marked by normal blood pressure, absence of cardio-vascular changes and with a large amount of albumin in the urine with or without casts and a change in the proteid formula of the blood, serum-globulin being three-quarters instead of one-third of the total, and albumin dropping from two-thirds to one-quarter, while at the same time the blood lipoids are greatly increased.

Due to the lowered blood proteid the osmotic pressure from the tissues toward the blood is diminished and œdema results.

The treatment consists in cutting down the fats of the diet, raising the proteid and restricting the carbohydrates.

A diet of 2500 calories containing 240 gm. protein 40 gm. fats and 300 gm. carbohydrates being given for a patient weighing 150 pounds. Upon this diet he has found rapid and permanent relief of the œdema.

Etiology.—Elliott (*J.A.M.A.*, vol. 68, No. 26) discusses a group of forty cases of nephritis of chronic type in which in 18 cases some focal infection was demonstrated with a reasonably close time relation to the nephritis, in the other 22 the relation was dubious.

Dental infections were discounted by the presence in all but four of some other possible source of infection. In 33 cases in which a blood Wassermann was done it was positive in one case.

ACUTE POLIOMYELITIS

F. H. MACKAY, M.D.

Neurologist to Montreal General Hospital; Lecturer in Neurology, McGill University.

THE seasonal incidence of acute poliomyelitis has been noted from the earliest recognition of the disease and at the present time a review of the appearance and treatment of this most crippling of all acute infections should not be out of place.

In any such review the discussion of the subject at the last meeting of the British Medical Association, under the section of Orthopædics and Diseases of Children, first attracts our attention.

In the opening paper at this meeting, Dr. E. Farquhar Buzzard discusses the classification and diagnosis of this disease, differentiating it from such other acute infective diseases as meningitis, toxic polyneuritis, Landry's paralysis, encephalitis lethargica, and disseminated myelitis, and presents a forceful plea for its early recognition while still under the observation of the general medical practitioner. To meet this obvious requirement it is essential that acute poliomyelitis be classified among the acute infectious fevers, such as scarlet fever, varicella, enteric fever and measles, and that it should no longer be regarded as an essential affection of the nervous system, surrounded by an atmosphere of mystery and relegated to the domain of the specialist.

When so classified, the disease will be readily regarded as a possible cause of the sudden onset of fever, headache, vomiting and convulsions and will demand the same diagnostic consideration as is given small-pox or typhoid fever.

It should no longer be necessary to await the full development of a flaccid paralysis before the possibility of this affection is borne upon the mind of the physician, and, especially is this so during an epidemic of it when every fever or chill should awake the observer to the consideration of its differential diagnosis.

The belief, heretofore so prevalent, that acute poliomyelitis was a painless disease has led to many mistakes, as the association of pain in the affected limbs, at once suggested the diagnosis of acute rheumatism and blinded the observer to the possibility of the much graver malady.

There is no doubt that Dr. Buzzard has struck a timely note in thus insisting on the classification of acute poliomyelitis among the infectious fevers and focusing the attention of the profession upon the early diagnosis of the disease. When we inquire, however, into the particular clinical manifestations which permit of a definite diagnosis while still in the pre-paralytic stage, we are forced to admit that there are none. Dr. Buzzard asks the question: "Can the diagnosis be made at a stage when appropriate treatment would be likely to avert an influence on the course of the inflammatory process in the spinal cord?" and answers it in the negative. Serum diagnosis is as yet-uncertain, and in any case the length of time required in its elaboration renders it of little practical value.

In our present state of knowledge, therefore, we must turn to the general practitioner, whose successful orientation of the disease among the acute infections prepares him for the earliest possible recognition of the disease and so offers the patient the best that our present-day knowledge provides in the way of treatment.

In discussing treatment, let it be at once understood that this is non-specific, and because so, may vary greatly, according to the ingenuity and resourcefulness of the physician; but it is gratifying at least to learn that a common note is struck by all contributors to the Newcastle discussion, in their insistence upon the necessity of absolute rest during the first few weeks of illness. The one exception to these views will be referred to again.

In order to apply our knowledge of the disease to appropriate treatment, it is necessary that we grasp the essentials of the pathological processes going on in the brain and cord. It has been and is still to some extent a common belief that the seat of the infection is in the anterior cornua and in the cells of this region, and there alone; but as Dr. Buzzard shows, the whole nervous system from the hemispheres to the peripheral nerve roots offers fertile soil to the ravages of the infective virus. Yet, judging from clinical observation, alone, the manifestations are those of damaged or destroyed anterior horn cells, and on this region, particularly, our attention must be focused.

A mental picture of the pathological processes operating in this region of the cord shows a group of cells in varying stages of vitality, gradually being destroyed by the surrounding œdema, vascular swelling and congestion, cellular exudation, and in some cases focal hæmorrhage, and it is not difficult to realize that many of these cells will die. A number of others will recover sufficiently to take up at least, partially, their function, while others may escape entirely from the ill effects of the injury they received.

Such a picture materially aids us in the management of the patient, for in the absence of any known agency that will affect this process, we must direct our efforts towards the rational management of the muscles controlled by the affected cells.

The first essential of treatment is rest, not simply putting the patient to bed and telling the friends or nurse that the child must rest, but directing that rest which must be absolute, towards the individual muscles.

Rest of muscle is not possible except under proper postural relaxation, and so posture becomes a necessary adjunct of rest. Here again no specific rules can be laid down, but if the principle of relaxation of the affected muscle is understood, close and intelligent observation during the first few days or weeks of the disease will enable us to adopt rational measures and to place the limb in such position as to avert tension or dragging upon the muscles showing evidence of failure.

In the opinion of Dr. Elmslie, this position is best maintained by use of plaster-of-paris splints or a plaster bed, while others believe that a box splint is sufficiently stable to insure complete rest; but this is obviously a question for the individual surgeon, so long as the essential principle is adhered to throughout the early weeks of the illness.

After the first few weeks many of the damaged cells will show evidence of regeneration, and for weeks and months following other cells will gradually regain function. As we have no means by which this regenerative process can be hastened, our energies must be directed toward the nutritional maintenance of the muscle so that functional repair of the neuron will link up with a muscle capable of contracting and thus permit restoration of a functionally intact neuro-muscular unit.

Muscle nutrition is best maintained by contraction of the muscle fibrils, and for this purpose, after the period of rest and in the absence of voluntary active contractions, we must resort to mechanical means.

Of these the galvanic current, with its make-and-break contractions, is our most rational aid. Electric stimulation is at best a poor substitute for voluntary stimulus, but with this stimulus we can induce contractions which, with their attendant chemical and circulatory changes, tend to maintain the muscle in the best possible state of nutrition, pending the return of functional activity in the cell and axis-cylinder.

Care must be taken in the application of the current. This is best done by treating each muscle individually, with both electrodes overlying the musle and with just sufficient current to induce contraction. Otherwise, spread of the current to other muscles, particularly the antagonistic group, may do more harm than good by stretching the paralysed muscle which we hoped only to stimulate to the point of contraction.

The faradic current is undesirable, and by inducing fatigue may do positive harm if used in the earlier stages of the regeneration.

Effective faradic response depends upon an intact neuron and neuro-muscular mechanism, and, in the writer's experience, voluntary contraction practically always precedes the return of faradic response, so that it is difficult to ascribe to faradism any practical value as a stimulant to muscle contraction, for by the time regeneration has advanced to a stage sufficient to permit of faradic excitability, we have at our command the much more natural and effective stimulant of volition.

The only role that faradic stimulation can play is that of an aid or substitute for the already present but necessarily weak voluntary stimulus, and, as such, should be used sparingly in order not to tire the recovering neuro-muscular mechanism.

In our present state of knowledge we are not justified in conceding to electricity any other role than that of a stimulant to contraction, and as such we can conceive only of an efferent stimulus acting on the neuron and contractile element in the muscle, but if we consider the neuro-muscular mechanism as a unit, we must realize that not only efferent but afferent stimuli from muscle to cell are operating in the maintenance of the normal physiological activity of the unit. It is, then, apparent that no form of artificial stimulation can be regarded as a worthy substitute for voluntary movement and voluntary exercise which should now constitute our chief agent in the restoration of full functional activity. The use of electrically charged baths or the blind dissemination of electricity throughout the body is to be deprecated and here, in passing we must consider the views of Dr. F. H. Humphries, who is, apparently, an ardent advocate of electricity in all its forms. As soon as the diagnosis is made, Dr. Humphries would begin active electrical treatment in the form of high frequency or condenser shocks, applied throughout the length of the spinal cord, which he believes lessens the congestion in the cord and relieves the affected cells of pressure. This he would follow up with static electricity, also applied over the spinal cord region, with an apparent disregard for rest and postural immobalization.

Dr. Humphries' plea for the generalized use of lights, condenser shocks and static electricity, is set in the most optimistic tone and offers a fitting sequel to his introductory remarks "that permanent paralyses should be an uncommon result" and, quoting from the teachings of electrotherapeutists, "by a proper appreciation of the available mechanical agencies we need rarely, if ever, encounter any paralytic deformity."

Without wishing to enter into a critical discussion of the views propounded by Dr. Humphries, we must feel that such statements, as quoted above, serve one timely purpose in indicating the wide flung fields of imagination, into which one may be led by the compelling force of his own optimism. In all nerve regenerative processes, whether necessitated by sudden trauma or the prolonged ravages of disease, we can see only one indication for the use of electricity and that is the inducement of contraction in the maintenance of muscle nutrition. Light massage and warmth to the limb are necessary adjuncts to rest, posture and galvanism in the maintenance of this muscle nutrition.

Much has been hoped for and expected in the treatment of this disease by the use of appropriate sera, and to this end some encouragement is derived from the report of Rosenow on the use of his immune horse serum (*J.A.M.A.*, 77, 588, August 20,1921). The serum is prepared from the repeated injection of the pleomorphic streptococcus isolated by Rosenow, and is administered intravenously, by preference.

Rosenow reports from a series of 259 cases, half of which number consists of cases treated by physicians to whom the serum was sent.

Of the 259 cases, 19 died, a mortality of 7.3 per cent.; and if moribund cases and those whose condition was beyond hope of improvement when the serum was given were not considered in the statistics, his mortality rate drops to 3.2 per cent. In comparison, 72 untreated cases, at about the same time and locality, showed a mortality rate of 36 per cent., while that of the New York City epidemic in 1916 is estimated at 16 to 25 per cent.

Again, in cases treated early and before paralysis appeared, the diagnosis being based on the general infective process with spinal fluid examination, increased cell and globulin content, only one case developed paralysis. Of those cases showing well-marked paralysis and treated early after the onset, 37 showed residual paralysis, or 21 per cent., while residual paralysis in the New York City epidemic was 64 per cent.

These are striking figures and, should this serum prove nearly as effective in the hands of the general profession as it has under the direction of the author, the necessity of the early diagnosis and treatment of poliomyelitis is apparent.

Tuberculous Infection and Tuberculous Disease. Hamburger (Wien. klin. Woch., September, 1921) states that the discovery of droplet infection by Flügge is the most important advance in infectious disease since the classical work of Pasteur and Koch. Infection takes place by coughing, speaking, and in the case of tuberculosis, only within the ordinary distance for conversation (1 to 1½ metres). There is no evidence that infection takes place in man by inhalation of dust. Everything, on the other hand, points to direct infection from man to man. Compared with tuberculous infection tuberculous disease is comparatively uncommon, though it is impossible to determine at present the relative frequency. Hamburger states that a short time ago his son, aged 12 years, developed phylyctenular conjunctivitis, which healed in about a fortnight, the general condition being unaffected. As Hamburger had been in the habit for many years of testing his children with tuberculin every six months, and the boy had always given a negative reaction before, the eye disease, which was accompanied by a positive reaction, could undoubtedly be attributed to a recent tuberculous infection. As the other four children still gave a negative reaction it was pretty certain that the infection was derived from some person outside the family. Hamburger therefore recommends that in combating tuberculosis special attention should be paid to prophylaxis against extrafamilial exposure to infection.

Foreign Hospitals

MEDICAL STUDIES AT PARIS

G. R. D. Farmer, M.B.

Medical practitioners in Canada, especially those contemplating a trip to Europe, may be interested in the following notes of a recent visit to the medical schools in Paris.

For general medicine the three great schools are those of Prof. Gilbert at the Hôtel-Dieu, Prof. Chauffard at the Hôpital St. Antoine, and of Prof. Widal at the Hôpital Cochin. The method of instruction is essentially the same in each of these, often each school has its own theories regarding a given subject, and these receive special attention whenever this subject is brought into consideration. The instruction at Prof. Widal's clinic might be taken as an example of the methods employed in France at the present time.

It may be well at the outset to mention the fact that French students receive instruction in clinical work in every year of their course. It is to be expected that a great deal of what they encounter in their early years is difficult for them to assimilate, but it is hoped that continuous contact with these points through the whole of their undergraduate career will lead to more perfect knowledge of them in the end. The students are divided into three classes, called respectively *internes, externes,* and *stagiaires.* The latter constitute the greater part of the student body and have to pass competitive examinations in order to proceed to the higher grades. These examinations are apart from those held in connection with passing from one year to another. The *stage* followed by a student at one of the clinics consists of about four months' continuous service.

In the medical clinic at the Hôpital Cochin, with the exception of Sundays, Tuesdays, and national holidays, there is a lesson at 9 o'clock every morning. Every Tuesday at 11 a.m. the Professor gives a special lecture in the amphitheatre on whatever research work may be engaging his attention at the time. These Tuesday morning lessons form a series apart and are attended by a very large number of medical men. The ordinary 9 o'clock lesson takes the form of a lecture in the amphitheatre by one of the Professor's assistants. The list of subjects is posted every week and includes as a rule fairly elementary subjects such as "sore throat," "blood pressure," or, "hemiplegia," but difficult problems are frequently treated, and very thoroughly too.

The lecture lasts for one hour, at the conclusion of which everyone repairs to the wards, where another hour is spent in illustrating the points which have just been considered, and in doing ordinary work in connection with the cases. At eleven o'clock the Professor himself arrives with great regularity. Nothing but very extraordinary circumstances prevent his appearance. During the holidays, and in the absence of the Professor, his place is taken by his ablest assistants, such as MM. Abrami and Brulé, who even rival their master in brilliancy. This conference takes place in one of the wards, or more rarely in the amphitheatre. One of the more interesting cases is chosen and placed at one end of the ward, the Professor sitting at the patient's bedside, facing the assembly, which consists of the students in his service at the time and also of medical men from all parts of the world. The stagiaires to whom the case had been assigned are situated at the bedside, opposite the Professor. The *externe* reads the complete history of the patient. The *interne* then tells all he knows about the case and discusses the differential diagnosis. Then in his turn the physician in charge of the ward from which the patient was chosen spends five or ten minutes discussing the diagnosis, giving his reasons for discarding certain hypotheses and for retaining others. Up until this time the Professor has been listening to what is being said, comparing this with the patient's condition at the time, and throwing in a question now and then so that the performance takes rather the character of a debate. Having finally satisfied himself as to what is the matter, he calls upon the stagiaires for their opinion. "What is there in the history of this patient which has particularly struck you?" is the way of opening his conversation with them. Proceedings up to this point have probably occupied about half an hour, and for the remaining half hour the Professor holds forth on all the possibilities to be considered in connection with the case, and the latest work and theories associated with them. There is always a great wealth of material in this hospital, and a few months' attendance at these conferences are of great interest and value. One is able to see in succession almost every type of disease; at the conclusion of each lesson one is at liberty to interrogate the patient and to examine the case thoroughly.

Those who desire to give their attention to some special branch of work have ample opportunity for investigating French methods. Paris has long been renowned as a neurological centre, and the clinic made famous by Charcot at the Salpêtrière in the last century is at present most ably conducted by Prof. Pierre Marie. Dr. Babinski's service at the Hôpital de la Pitié is also much frequented by neurologists; at the same hospital Prof. Vaquez conducts his admirable service for diseases of the heart. Chest conditions can be studied to the most advantage with Prof. Sergeant at the Hôpital Laennec and at the Hôpital de la Charité; gastro-enterology at the Hôtel-Dieu. It is almost superfluous to mention the old Hôpital Saint-Louis and its famous clinic for dermatology and the venereal diseases. Specialists in diseases of children will find Prof. Marfan at the Hospice des Enfants Assistés a charming and very valuable teacher.

The afternoons may profitably be spent in the rooms of the Faculty, where various courses of lectures are always going on. The instruction which I have just outlined is open to all doctors. One must first register; the card thus obtained allows access to the library, the morgue, etc., and is often very handy, especially in Paris, where cards of identification are often indispensable. At all the clinics post-graduate courses are given from time to time. These are known as "cours de perfectionnement." They are essentially practical, usually last two or three weeks and cost one or two hundred francs each. The courses are very good but there is a tendency to overcrowding at certain seasons.

In obstetrics and surgery the same system is followed as a rule. The work of the Pasteur Institute and Hospital is too vast to be approached in this article.

Life at Paris is very pleasant and not at all expensive if one is content to live in modest quarters. With practice one soon becomes sufficiently familiar with the language. I considered that it added interest to the work, as there is a double stimulus to one's attention. After a month or so one is quite at home in it. French hospitality is well enough known to need no recommendation, and the Honourable Philippe Roy, Canadian Commissioner at Paris, spares no pains for the comfort of visitors from this country.

Arsenical Conjunctivitis.— Milian (Paris Med., October 15, 1921) states that all arsenical preparations are vaso-dilators, and are liable to give rise to conjunctivitis. It is particularly frequent after organic compounds, such as atoxyl, hectine, galyl, and the arseno-benzols. Previous affections of the conjunctiva, such as are caused by mustard gas poisoning, hay fever, and ciliary blepharitis, favour its appearance. Arsenical conjunctivitis is merely a paralytic dilatation of the conjunctival capillaries. The conjunctivitis, which is more or less marked according to the form and intensity of the intoxication, may assume a localized or a general form. In the localized form, which is the most frequent, there is more or less pronounced congestion of the lower and outer quadrant of the conjunctiva, the lesions being bilateral and symmetrical. The free border of the lower lid and the lower conjunctival cul-de-sac are also slightly congested. The congestion is not accompanied by discharges of serum or pus, but occasionally there is an excess of lachrymal secretion. In the generalized form the whole conjunctiva is involved, the lids are stuck together, and there is chemosis. In spite of the intensity of the symptoms the inflammation subsides completely within one to four weeks. Treatment consists in instillation of one or two drops of adrenaline (1 in 10,000) morning and evening, associated with a collyrium of zinc sulphate (1 in 10), and a boracic spray three times a day. Brit. Med. Jour., December 10, 1921.

Editorial

A SKETCH OF RENAL DIAGNOSTIC METHODS

SINCE the days of Bright the presence of albumin in the urine has been held to denote the presence of kidney disease. That this is not always so, does not detract from this long-tried diagnostic sign, though the differentiation of various types, built upon the varying amounts of albumin and its accompaniment by different sorts of formed elements, has long been proved fallacious.

With the advent of the new chemistry, a new turn altogether has been given to the study of diseases of the kidney, and though these methods have greatly clarified our understanding of many of the problems concerning the relation of the kidney to the metabolism of the body, we are reminded by a quotation from Theodore Janeway made in 1916 that this knowledge brings us no whit nearer the understanding of the real cause of nephritis, and until a clue is obtained of the etiology, all treatment of renal disease is empirical, and consists rather in managing the patient than in curing his disease. But that this "empiricism" has by accurate chemical determination been made more "rational," in the words of Professor Rudolf, no one can deny.

What the barium meal is to gastrointestinal diagnosis, and what the electrocardiagram is to heart disease, the various renal efficiency tests are to renal disease; and as the other two have very abrupt limitations in what they can reveal, as well as an undoubted capacity for concealment, so methods of testing renal efficiency have not the power to clear up all problems in kidney disease, and may, when removed from their clinical setting, even dangerously distort the picture; and it may also be safely stated that of all the tests employed, there is not one which, used independently of the others, can be relied upon to give a satisfactory revelation of the general fitness of the kidney as functioning unit.

It may be of service to briefly summarize the methods most commonly in use with a word as to some of their salient features. The renal test meal, as modified by Mosenthal, consists in the administration of a daily mixed diet approximating that of the average individual given at set hours, *e.g.*, 8, 12 and 5. The diet contains a known quantity of nitrogen and of salt and of water, and the urine is collected during two-hour periods throughout the day, and the night urine from 8 p.m. to 8 a.m. collected as one specimen, no fluid having been given after 6 p.m. The quantity and specific gravity should be in inverse proportion and a difference of 9 points should appear between the highest and lowest readings. The total night urine should not exceed 400 c.c. The salt and urea output should approximate the intake and the water output in 24 hours should be within 400 c.c. of the intake.

The essential features of this test may be carried out in any household, all the requisites being three meals at set hours with a measured quantity of fluid, *e.g.*, 1500 c.c., seven containers for the separate urines, a measuring glass and a specific gravity bulb. A drawback is the interference with the test from gastric disturbance, so common in nephritis. Tests of dye excretion as phenolsulphonepththalein, of which .06 gm. is injected intramuscularly after the bladder is emptied and the urine collected for two hours, rendered alkaline and diluted to1000 c.c., and matched in colour in a colorimeter. Normally 60 per cent. of the dye should be recovered.

In the absence of a colorimeter, an equal amount of the dye may be dissolved in another 1000 c.c. of water and the two solutions compared in test tubes of equal calibre, then if 10 c.c. of the known solution requires dilution to 25 c.c. to equal the colour of the unknown, then 10-25ths x 100-1 equals 40 per cent., or the percentage in the unknown specimen.

The drawbacks of the dye test are that it is not practicable in urines containing pus or blood, and it is stated by Hugh McLean that there is a high percentage of error even up to 20 or 30 per cent., but this is not the impression of those who use it most.

The urea concentration test, in which 15 gm. of urea is given by the mouth and the urine of the following two hours examined. This should show at least two per cent. of urea from a normal kidney. The criticism has been made that since this amount of urea roughly duplicates the ordinary alimentary nitrogen, that a finding of 1 per cent. without the ingested urea would have the same significance. It is also stated that the urea is not uniformly absorbed and thus a fallacy arises.

The coefficient of Ambard, modified by McLean is as follows: The blood urea is estimated in the middle of a period during which the urinary urea is also estimated and the relation between these two stated in relation to a normal. At present this does not seem to offer any information not also acquired by other methods.

The examination of the blood for urea, uric acid and creatinin is now practically indispensable in the estimation of kidney function, the disadvantage however is the difficulty of obtaining accurate readings without special laboratory facilities. Though urea retention is not the cause of uræmia, it is a sign of relative impermeability of the kidney, for though a poor kidney and a good kidney must on a similar diet excrete an equal quantity of urea, the poor kidney will only do its work under a higher "head" or concentration of the substance in the blood. Other conditions such as septic peritonitis and intestinal obstruction show a high blood urea for which the kidney cannot be blamed.

It is generally conceded that a high creatinin content is of much value in prognosis—above 5 mg. per 100 c.c. being practically of lethal significance; but by the time this figure is reached the observant clinician has also read elsewhere the signs of approaching death, and he is the wise physician who after gathering all the information which the laboratory affords does not overlook that which the patient alone can furnish.

ON THE VALUE OF DRUGS IN AFFECTIONS OF THE URINARY TRACT

WITH perhaps the exception of the stomach and intestinal tract, no system in the body is more susceptible to the action of our drugs for good or for ill than is the urinary tract. It is the natural pathway for the elimination of all substances which in any way interfere with the normal constitution of the blood. In the elimination of irritating materials (and many of our drugs are irritants) definite damage may be done to the renal cells. Cells that have previously been damaged under the wear and tear of life are particularly liable to be affected. These facts are known to all, but are sometimes forgotten. Christian of Harvard has by careful experimentation also shown how damage may be done by the administration of even the simpler diuretics such as the potassium salts in acute and subacute forms of nephritis. We may add that for the treatment of all forms of infection in the urinary passages no antiseptics have yet been introduced to the profession which in large doses may not induce, when given internally, signs of definite irritation in the renal epithelium. While the Hippocratic maxim "Do no harm" may be tempered occasionally with the more modern adage, "Of two evils, choose the least," caution and frequent examination of the urine are always demanded when large doses of irritant drugs are administered. In a recent paper on the value of drugs in urology by Dr. Hugh H. Young of Johns Hopkins Hospital (*Jour. Amer. Med. Assoc.*, October 22, 1921) the writer discusses the value of the pharmacological armamentarium at the disposal of the urological surgeon. The empiricism of the past has handed down a large number of drugs, the majority of which have little scientific foundation for their therapeutic usage. Dr. Young in order to arrive at some basis for the determination of the value of these drugs in diseases of the urinary tract, made out a list of eighty drugs, including indiscriminately those introduced into the system by the mouth or by deep injections and those used locally, and then forwarded the list to thirty of the best known urologists in America with a request that they signify those which they deemed of most value. Only eighteen drugs received the approval of fifty per cent. of these specialists; and of these, eighteen, hexamethylenamine stood first in the list, although Young states that as usually given it is almost inert. Recent experiments by Burnam and Hamman are said to have shown that unless the urine is quite acid, formaldehyde is not liberated in the kidney in sufficient quantity to be germicidal or even inhibitory. During its administration the urine should not be too dilute, and acidifiers such as acid sodium phosphate and sodium benzoate to the extent of 40 grains daily should be taken, but not at the same hour as the hexamethylenamine, which latter according to Young, must be given in large doses (60 to 90 grains daily) to obtain results of value. Its chief value is to prevent instrumental infection of the bladder. While such large doses may have value, and perhaps may be given in some instances without disturbance of digestion and without irritation of the renal cells, we are convinced that in a large percentage of patients signs of irritation will ensue, and will demand careful watching. Smaller doses have not in our hands proved inert. Experiments are at present being carried on to determine the value of many of the aniline dyes as urinary antiseptics for internal administration. Several of them have given excellent results with almost no renal irritation in animals, but prolonged clinical testing is required before definite statements can be made.

Several of the eighteen drugs which obtained the approval of the urologists are suitable only for local employment. Dr. Young considers that potassium permanganate and argyrol, drugs which stand high in the approved list, have been shown experimentally to be very weak antiseptics, and he refers the value attributed to them to the fact that they produce little reaction and irritation. In reference to the local use of antiseptics and germicides in the urinary tract, Young states that it is still by no means clear how much of the favourable action of a drug is due to its germicidal or antiseptic action, and how much to cleansing effects or to stimulation of tissue reactions. Many powerful germicides have been used in the urinary tract, but no uniform success has attended any of them. It seems probable that this is largely due to the depths to which the inflammation often extends into the deeper tissues. Young considers, however that there is little doubt that as our selection of suitable drugs increases, more and more cases will respond to germicidal applications. There is unquestionably a great future for germicidal treatment in venereal prophylaxis, in acute gonorrhœa, and in other infections of the urinary tract.

Discussing the relative value of the various sedatives and antispasmodics for the relief of pain and spasm in the ureter, bladder and urethra, Young after referring to the general use of opiates, especially of morphin and codein in conjunction with belladonna and hyoscyamus, quotes the results of Macht's experiments. Macht has shown that while morphin and codein relieve ureteral and vesical colic through their action on the pain centres of the brain, their effect on the contraction and tonicity of the ureters and bladder is stimulating. Papaverin, on the other hand, while not a powerful central analgesic, exerts a remarkable relaxing or antispasmodic effect on smooth muscle. To obtain this action in a full degree a solution of papaverin has been injected by ureteral catheter to facilitate the passage of a ureteral calculus.

A combination of the different opium alkaloids such as pantopon, contains a sufficient amount of papaverin alkaloids to counteract the stimulating peripheral effects of morphin on smooth muscle. For this reason pantopon has proved more efficient than morphin clinically in relieving colicky pains in general, and ureteral and vesical pains in particular. Benzyol benzoate also has proved efficient in these conditions. In subacute renal and vesical pains this drug may be given by mouth, from 2 to 4 cc. of the 20 per cent. alcoholic solution three or four times a day. Recent experiments at this clinic show that the action of the different belladonna alkaloids (atropin, hyoscyamus, scopolamin) as antispasmodics for the bladder is not the same. The galenical preparations of hyoscyamus appear to be more sedative than those of belladonna.

Certain drugs, while not of therapeutic value, are of the utmost importance in urologic practice as diagnostic agents, and therefore must be named among the useful drugs. We need only to mention the invaluable information given by phenolsulphonephthalein regarding the functional powers of the kidney and the value of sodium bromid and thorium solutions in connection with pyelography. Radium has a wide field of usefulness in urology, as it may be applied through so many portals. The various drugs employed in the clinical and bacteriologic laboratory are also very necessary. This department of medicine when associated with reports on the chemistry of the blood, with renal function tests, and with the employment of the cystoscope and the roentgen ray, may now be regarded as one of the most exact of the medical sciences.

CANADIAN MEDICO-LEGAL JURISPRUDENCE

AT the last meeting of the Ontario Neuro-Psychiatric Association, held at Mimico, Dr. E. W. Ryan read a paper on "The Present-Day Aspect of Canadian Medico-Legal Jurisprudence," in which he made a strong plea for some improvement in our judicial methods. He illustrated his argument by giving the details of many important medico-legal cases in our courts in which the important point was a decision as to whether the accused was insane or not. The law at present holds that a man may be insane on one subject and sane on others. Medical science cannot assent to this opinion.

Dr. Ryan made the suggestion that there should be a medical commission of recognized psychiatrists appointed in all mental cases to investigate each calmly and lay the results before the Attorney-General, the judge and the jury. The idea is not a new one. In Germany and Australia when a person under indictment pleads insanity, he is sent to a psychiatric clinic or mental hospital, to be retained there until a careful study of his case has been made, and it can be decided whether insanity existed at the time the act was committed. In the State of New York provision is also made for the appointment of a commission to examine an accused person as to his insanity.

Last year the Province of Quebec appointed Dr. F. E. Devlin psychiatrist to the courts. Dr. Devlin, however, has already the time-absorbing duties of Superintendent of the St. Jean de Dieu Hospital, and will find it difficult to spare the additional time requisite to examine every person brought before the courts suspected of being insane. It would appear also to be very desirable that such an important decision should not be left in the hands of one person, be he ever so capable and skilful. The public will be better satisfied by the appointment of a commission composed of three qualified psychiatrists who should examine every person suspected by the court to be suffering from mental abnormality, and whose decision should be final. The ideal to be kept in view by such a commission should be, as Dr. Ryan says, the dignity of medicine and the majesty of justice. The legal profession should not have the right to examine a psychiatrist on a mere hypothesis. The medical profession must insist on the fact that a person cannot be insane and sane at the same time.

Psychiatry today is not merely the study of "insane" persons. It covers the much larger field of human behaviour and the establishment of research bureaus to so many of the courts in the United States shows that at last this particular branch of medicine is beginning to take its rightful place in the community.

If the provincial governments would appoint such a commission of qualified psychiatrists and make their decision final, it would not only be more economical for the community but it would prevent the scandals that occasionally occur in these cases under the present method; and the condemning of an irresponsible man who more properly should be remanded for hospital treatment.

Hon. W. E. Raney, Attorney-General for the province of Ontario, promised the meeting that if legislation improving medico-legal jurisprudence was prepared, he would see that it was taken up at the next meeting of the legislature. If Ontario takes this step she will be the first province in Canada to do so.

ON THERAPEUTICAL AND PHARMACEUTICAL PROBLEMS

AT the suggestion of the Committee on Pharmacy of the Ontario Medical Association, about a page of the *Journal* in each number, during the coming year, will be devoted to short concise notes on problems connected with the prescribing and administration of drugs, and on questions of pharmacy of interest to the physician. In this page notice will be taken of any untoward effects arising from the therapeutic use of newly-introduced remedies, and the claims for efficiency made by some patented preparation may be discussed. The object aimed at will be the enlightenment of the practitioner on the best methods of prescribing medicines in a pleasant, safe, and effective manner. Any questions connected with the subject addressed to the *Journal* will be answered, and short contributions containing interesting and useful information will be welcomed from any member of the Association.

Therapeutical and Pharmaceutical Items*

Iodides and Bromides in Mixtures.—Very frequently the practitioner wishes to prescribe for his patients either bromides or iodides. In the case of both of these bodies he is tempted to employ the potassium rather than the sodium salt. Potassium bromide is more expensive than the sodium salt (the former $1.10, the latter $0.85 per pound) and has no definite pharmacological advantage. The body absorbs daily large quantities of both sodium and potassium salts with the food, and as we all know, relatively large amounts of sodium salt are always found in the blood stream and potassium salt in the tissues. The balance between these is kept accurately adjusted by the body. The amount of potassium salt that would be given is not sufficient to upset this balance. Further, the sodium salt is definitely less unpleasant and more easily covered by flavours. Extensive and careful experimentation has shown that of all pharmacopœial flavours liquid extract of liquorice (20 min. per 20 gr. of salt, with water up to 60 min.) is the best. There is absolutely no rational reason for prescribing strontium bromide, nor for giving a combination of sodium, ammonium and potassium salts.—J. Deas, *Dept. of Pharm., U. of T.*

Elixir Lactopeptine.—It is a habit with many physicians to employ elixir lactopeptine as a flavouring and colouring, in spite of the fact that they are unaware of its exact composition. This proprietary preparation has been imitated in the Canadian Formulary under the name of elixir pepsini compositum. Its formula is as follows:

Pepsin	175 gr.	10 gm.
Pancreatin	17½ gr.	1.0 gm.
Diastase	17½ gr.	1.0 gm.
Lactic acid	15 min.	1.5 cc.
Hydrochloric acid	20 min.	2.0 cc.
Glycerin	5 fl. oz.	125 cc.
Distilled water	10 fl. oz.	250 cc.
Tincture of cudbear	5 fl. oz.	125 cc.
Purified talcum	1 oz.	30 gm.
Aromatic elixir, sufficient to make	40 fl. oz.	1000 cc.

It will be seen that pepsin, pancreatin, and diastase are exhibited in the same mixture, and that an acid one, which will lead to destruction of the pancreatin and diastase by the pepsin, while the alcohol will destroy the activity of the pepsin. The ferments are quite valueless, yet they are expensive ingredients. The flavour and colour can be adequately obtained with the omission of these ferments and at a considerable reduction in cost.

The colouring principle is tincture of cudbear (tincture persionis), an excellent colouring for acid mixtures, which should be included in the British Pharmacopœia, as the pharmacopœial red colours, tinctura cocci, tinctura lavandulæ composita and tinctura cardamomi composita, lose their colour in an acid mixture.

The colour and agreeable flavour could be obtained by the following:

Hydrochloric acid	2 drachms
Tincture of orange	4 drachms
Tincture of cudbear	5 fl. oz.
Alcohol	5 fl. oz.
Syrup,	16 fl. oz.
Water, sufficient to make	40 fl. oz.

A physician could readily prepare this in his own pharmacy or get his pharmacist to keep for use such a flavouring mixture. It must, however, be remembered that the flavour is acid, that it should not be used with carbonatea or liquor arsenicalis, and that it will quickly destroy all glucosides, hence it must not be used with digitalis or strophanthus.—J. Deas, *Dept. of Pharm., U. of T.*

On Globeol.—As the profession has recently received samples of "Globeol," a word or two in regard to its composition may be of interest. According to its literature "Globeol contains the total extract of horse blood (red corpuscles and serum). It contains the reconstituent and modifying elements of the blood in their entirety: plasma, oxidases, lipoids, antibodies, endocrins, hormones, cytopoietins and other stimulins, catalases, agglutinins, antitoxins, precipitins, etc."

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*Under the charge of the Committee on Pharmacy, Ontario Medical Association.

In addition, it contains the active principle of the seeds of Paullinia sorbilis, and "lastly, the bittér extract of the Picrana excelsa, a powerful tonic agent, stimulates the gastric and biliary secretions, increases intestinal contractions, thereby checking constipation."

The physician often requires to administer iron, which is undoubtedly of great benefit in chlorosis, and possibly in secondary anæmia. There is no great reason to believe that organic iron is in the least better than inorganic iron. Each of these pills, weighs 3.7 grains, without its white covering, 1.85 grains. If it consisted entirely of blood, this amount would contain 0.005 grains of iron. One five-grain official Blaud pill contains 0.55 grains of iron, a much more reasonable amount to administer.

Paullinia sorbilis is a plant from the seeds of which guarana is obtained. Its important constituent is caffeine. A test showed the presence of caffeine in the pills.

In Picrana excelsa most practitioners will fail to recognize our well-known friend quassia, a useful bitter, but whose action, save such reflex effects as it produces from the mouth owing to its bitter flavour, is nil. Its incorporation in a pill of this character is valueless.

Fortunately, for the patient, the proteins of the blood are completely destroyed in digestion, as are also the agglutinins, antitoxins, precipitins, etc., which are supposed to be the peculiar feature of this remedy.

Surely the clinician will not be deceived by the supposed quotations from French authors.—V. E. Henderson, *U. of T.*

Role and Development of Drug Therapy.—A general survey of treatment as it exists today is made by L. G. Rowntree, Rochester, Minn. (*Jour. A. M. A.*, Oct. 1, 1921)and he considers the more important factors which have in the past, or may in the future, exercise a retarding or accelerating influence on the progress of treatment. Drugs, he says, find their most extensive application in the field of medical treatment; but, to the thinking physician, treatment no longer consists merely in giving drugs or applying other measures of relief. The essence of treatment consists in recognizing the pathologic process; in understanding its causes, the mechanism involved in its production and in the development of its clinical manifestations; in knowing the character, extent, and probable outcome of the resulting functional and morphologic changes; in valuing correctly the significance of clinical and laboratory findings; in ascertaining the indications for, in knowing the mode of action of, and in applying the most effective measures for its prevention, abortion, amelioration or cure. As medicine becomes more rational, it becomes more effective, and drugs play a relatively smaller but better defined role. The essentials of good treatment are: correct and early diagnosis; a true conception of the cause and nature of the derangement; familiarity with the manner in which the derangement can be corrected, and the knowledge of, and ability to apply the most effective measure of relief. In the final analysis it is seen that the fundamental factors responsible for the tardiness of medical progress have been: (1) the inadequacy of science during its early period of development, to cope with the complex problems of the human organism and with the processes of life and of disease; (2) the incorrect approach to the subject, that is, the employment solely of speculation uncontrolled by observation and experimentation. The public and many physicians fail to recognize that progress comes through investigation, that practice is based on investigation, and that medical investigation means better care of the sick, greater public health and happier communities. Rowntree continues his address by taking up such topics as the evolution of science and the adoption in medicine of scientific methods; development of clinical medicine; the development of pharmacology; the relation of chemical constitution to pharmacologic action; the discovery of micro-organisms and of their relation to disease; aseptic and antiseptic surgery; specific chemotherapy; nutrition, metabolism, and the functional conception of disease. Lines of future development are indicated. A national institute of pharmacology and experimental therapeutics, Rowntree asserts, would prove of inestimable value to American medicine. —*Jour. A. M. A.*, October 1, 1921.

Abstracts from Current Literature

SURGERY

Enlargement of a Spleneculus to the size of a normal Spleen after removal of a ruptured Spleen ten years previously. Eccles, W. McAdam and Freer, G. O. Brit. Med. Jour., Oct. 1, 1921, p. 515.

On May 24, 1910, Mr. R., aged 21, was injured while playing football. Four hours after the injury was sustained, the abdomen was opened and a ruptured spleen found. The organ was removed in toto, and weighed thirteen ounces.

September 4th, 1920, ten years after the accident, Mr. Eccles operated to cure a post-operative ventral hernia which had gradually become more and more distressing to the patient. On opening the abdomen some adhesions of omentum were found and separated. Then to the astonishment of all present a well formed normal looking spleen was seen in the usual position. Knowing the previous history the organ was fully examined and was found to have a definite pedicle in which could be felt pulsating vessels, and the shape, size, notch, colour and consistency all appeared to be those of a normal spleen. A. Ross

Diverticulitis of Colon. Lockhart-Mummery, J. P. Internat. Jour. Gastro-enterol., Aug. 1921, p. 160.

Diverticulitis is not as rare a disease as has been supposed, nor is it a disease of the post mortem table, but one which, if diagnosed, can be very successfully treated.

Diverticulitis is an acquired condition, and not congenital The diverticula themselves are not harmful; it is their tendency to retain faecal material and become ulcerated which causes trouble.

The various complications which may result are discussed in detail. Acute and chronic sepsis in the abdominal cavity, perforation onto the skin or into the abdomen or into the bladder, and secondary carcinoma are discussed.

The differential diagnosis, especially from inoperable cancer of the colon is described at some length. The value of x-ray examination, more particularly after clearing the bowel of the contained barium, so as to enable the injected pouches to be seen, is described and its value discussed

The various operative measures which can be used to treat diverticulitis are described and their relative value discussed A. T. Bazin

Occult Blood in Stools. Abrahams, Adolphe. Internat. Jour. Gastro-enterol, Aug 1921, p 144

In many respects the identification of occult blood in stools, is the most important diagnostic feature in some gastro intestinal diseases, because frequently the differential diagnosis between functional and organic troubles may depend upon a simple chemical test of stools revealing the presence of occult blood

Occult blood represents only blood coming from the upper alimentary tract and its interest lies chiefly in its relation to gastric or duodenal ulcer and carcinoma An haemoglobin free diet should be followed for several days preceding the examination of the stools The complete elimination of all possible sources of haemorrhage is a matter of some difficulty Very small quantities of blood, such as could result from abrasions following the use of the stomach tube or hard tooth brushes are negligible for clinical purposes. Experiments made by the author show that at least one c.c. of blood taken at one time is necessary to obtain a reaction.

The tests best suited for general use, are the guaiacum and the benzidin tests. The author uses and advises this modified benzidin test: Four drops of solution of benzidin are placed in a tiny porcelain beaker; to this one drop of the fecal emulsion is added by another pipette and one drop of hydrogen peroxide by a third. In this manner fresh pipettes can be employed for every emulsion tested and the risk of contamination is abolished.

In testing the stools it is advisable to use first the more crude guaiacum reaction, followed, when negative, by the more sensitive benzidin test. A negative benzidin reaction may be taken as absolutely conclusive proof of the absence of blood. Tests more sensitive than the benzidin should not be employed for clinical purposes, as the benzidin is sensitive in the dilution of 1 to 300,000. The reaction should provoke a decided element of blue in the coloration. Iron and green vegetables are best omitted from the dietary of the patient under investigation. Bismuth has no effect on the reaction.

The interpretations of results are sometimes difficult and absence of occult blood is not always proof that no ulcer or cancer is present. The reaction is valuable, if repeated at frequent intervals and taken in conjunction with the other elements that must lead the physician in making a diagnosis. A. T. Bazin

Medical Treatment of Gastro-duodenal Ulcer. McCasky, G. W. Internat. Jour. of Gastro-enterology, Aug. 1921, p. 180.

Simple gastro-duodenal ulcer is primarily a medical and not a surgical disease.

The most favourable conditions for continuous repair, twenty-four hours each day, with full nutrition and suitable local medication, can be secured by the duodenal tube. Milk and cream, reinforced by melted butter, and given per os hourly for twelve hours, followed by twelve hours' rest, with the required alkaline treatment, is the next best method and will successfully meet the needs of most cases.

Recurrence is not probable if original causes, such as infections, bad dietetic habits, etc., are removed. Whether or not a recurrence is to be treated surgically should not be decided by the mere fact of recurrence. The character and duration of the original treatment, the evidence of complete healing, and especially the subsequent management of the case dietetically and otherwise are essential factors in the final judgment. Surgery might sometimes be preferable, because of the impossibility of removing casual factors. Extreme indurations, especially if obstructive in character and which are proven to be so by their failure to yield to correct medical treatment, require surgical measures. A T. Bazin

Influence of Teeth upon Digestion. Berger, A. Internat. Jour. of Gastro-Enterol, Aug. 1921, p 188

From a phylogenetic standpoint the teeth must be regarded as organs of digestion, although their value as real factors in the actual digestion has not only been underestimated, but even questioned. Mastication considered alone is a purely mechanical division of food into small particles, the smaller these particles the better, because they can be attacked more easily and completely by the digestive juices which have to convert the ingested food into assimilable substances. Insalivation of the food during mastication is important from a chemical and mechanical point of view.

Although life is possible even after the loss of all teeth and therefore, without the benefits of mastication, health cannot be considered perfect under the circumstances. Many cases of indigestion have been cured after the masticatory apparatus, which in normal conditions is perfectly built and balanced mechanically and physiologically, has been restored to proper function.

The teeth, their investing tissues and contiguous structures are influenced by the general condition of the individual; they influence the whole system and are in their turn influenced by systemic pathological conditions

Undoubtedly the eradication of septic conditions of the mouth has often been followed by the most gratifying results in cases of chronic appendicitis, cholecystitis, gastric and duodenal ulcers, etc. The great fallacy lies, however, in the dissemination of and the insistence upon the claim that oral foci of infection and oral sepsis play a predominant part in the causation of these diseases.

The sources of oral sepsis can be divided into three groups· First group includes general filthy and neglected condition of the mouth; poor fillings, ill fitting bridges, crowns and dentures; carious teeth. Second group includes all conditions known under the term pyorrhea alveolaris. Third group includes the pulpless or devitalized teeth

It is evident that the sources of sepsis of the two first groups must be eliminated in all cases, because they are really the cause and often also the effect of general systemic disease. The question of preservation of the pulpless tooth is a very important one. They may become a source of sepsis, but their useful preservation is to be recommended, because it can be accomplished with perfect safety and satisfaction to the patient and therefore the summary removal of pulpless teeth, as a potential source of sepsis, has to be condemned. A. T. Bazin

Four Cases of Malignant Tumours of Branchial Origin (Quatre cas de branchiomes malins). Lenormant, Ch. Jour. de. Chir., October, 1921, vol. 18, page 358.

The above author reports four cases of malignant tumours of the neck of branchial origin. In his introductory remarks he states that malignant tumours of the neck of branchial origin are not so rare as noted in the classic works. In 1907 Siegel collected 79 cases from the literature. During the last two years Siegel found six additional unreported cases and the author during a similar period has operated upon four. Of the four latter cases, all of which were studied histologically, 3 presented habitual evolution, i.e., stony hardness, markedly irregular in outline, situated deep in the carotid and carotid-submaxillary region, invading rapidly the neighbouring structures with all the characteristics of a solid malignant neoplasm. In the fourth there was a transformation of a pre-existing branchial cyst which took on malignant growth previous to operation. Its removal was followed in a few weeks by recurrence of tumour which was rapidly growing and solid. This latter type of case is most rare. Most branchiomata are mixed tumours.

The cases reported follow:

Case 1.—Man æt. 58 Tumour size of a small egg on the left side of neck, apparently cystic and seemed to be connected with the left lobe of the thyroid so diagnosis of cystic goitre was made. Operation on February 24, 1919. Collar incision, but it was necessary to section the sterno-mastoid on account of tumour being adherent to deep structures. Cyst was independent of thyroid and its enucleation was very difficult In removing it it was accidentally opened and serous fluid exuded and numerous vegetations were seen on inner wall. Five weeks later he came back with recurrence. At this time the whole left side of neck from clavicle to angle of jaw was a diffuse hard, irregular tumour mass apparently infiltrating all the deep structures. There was considerable pain and loss of weight.

Second operation April 4, 1919. Resection of tumour mass, it also being necessary to sacrifice internal jugular and subclavian veins. In addition all the muscles in this region were excised Operation wound did not heal and patient died on June 20, 1919. The tumour was of the mixed type on first removal, containing both epithelial and meso-dermic elements, cartilage cells being noted in the wall. On removal at second operation the tumour was sarcomatous in nature.

Case 2.—Man æt. 55. Tumour of some months' standing, size of an egg, on right side of neck extending from mid-neck to parotid, was hard, irregular in outline and surface and adherent to deep structures. Operation February 13, 1920. Wide resection. Seen April 20, 1920. Recurrence in lower area of scar.

Case 3.—Man æt. 60. Tumour of right submaxillary-carotid region. Size of one's fist, hard, irregular and adherent to deep structures. • There were general signs such as loss of weight, etc. Operation December 4, 1920. Wide resection. Recurrence in February, 1921

Case 4.—Man æt 61. Tumour in left cervical region, size of egg, of extreme hardness, adherent to sterno-mastoid which covers it, also to deep structures. Operation June 30, 1921. Wide resection of tumour, muscles and internal jugular. Seen again in July, 1921, in satisfactory condition without any sign of recurrence.

The author cites various opinions. Veau says "The diagnosis of branchial epithelioma is probable when there is a malignant tumour in the carotid region having all the characteristics of secondary glandular cancer and where one is unable to find the original neoplasm." The author prefers to make his diagnosis by exclusion. The tumour is unique; its volume, its irregularity, its adherence and early fixing, the rapid manner with which it infiltrates surrounding tissues forming a circumscribed indurated mass, such as is seen in cancer of breast or parotid. Lympho-sarcoma is much more rapid, almost inflammatory in appearance, with enormous embossment and even fluctuating redness of the skin. In addition fever is present, which is not noted in branchioma. Tumours of the carotid body are rare and the author has never seen one, but they are regular in outline and well limited, of soft elastic consistency and the presence of transmitted impulse and bruit is noted. The course is benign and they do not invade the surrounding tissues.

The following principles are laid down regarding treatment:

1. It is necessary to have good wide exposure and proper skin flap. 2. Sacrifice muscles and internal jugular vein if involved in the slightest degree. 3. Conserve arterial route if possible. 4 Save main trunks of nerves if possible, particularly the vagus. 5 Enucleate progressively from below upwards and from behind forwards.

The prognosis is exceedingly bad, the only hope being surgical interference. R. B. Malcolm

Blood Transfusion as a Therapeutic Agent in Pædiatrics. Spohn, Howard. Arch. Pædiat., October, 1921, vol. 38, page 646.

The use of a mother as donor for her child is not unaccompanied by danger, as fatal cases of agglutination and hæmolysis are reported. In a series extending over three years, in the Toronto Sick Children's Hospital, without preliminary tests, one fatal case resulted. About 33 per cent. of mothers and infants are in different groups (Unger). It is true that only about 13 per cent. of infants possess agglutinins in their blood, and in only about 25 per cent of infants may their cells be agglutinated by the serum of any group. Adults show that 97 per cent. have agglutinins, and about 50 per cent. of adults may have their cells agglutinated. The margin of safety in infants is therefore large under six months. At this time the blood group of the infant is usually established and all infants at four years are definitely grouped. The non-agglutination of the infants' cells depends on the non-existence of receptors before six months, and agglutinins are sometimes acquired first. In infants, tests should be carried out with blood of intended donor rather than a group test to be depended upon for safety.

The syringe method of Lindeman with 20 c.c. all glass syringes is the best for children, though the author uses the citrate method also. He claims that the latter produces more chills and reactions These are due, in part at least, to the alteration in the platelets in the citrate procedure. When these are removed fewer chills occur. Toxins are said to develop in three minutes in blood that stands. The angio-neurotic œdemas, as sudden œdema of the larynx immediately after transfusion, is said not to occur in the direct method of blood transfusion. The use of the Lindeman method in infants as described necessitates dissection of a vein The amount advocated for infants is easily determined. It is considered that the total blood volume in an infant averages 14.7 per cent. of the body weight. In fatal hæmorrhages at least one-quarter to one-half of the total volume is lost. If then the blood content is 147 c.c. per kilogram of weight, transfusion need not exceed at any time 70 c.c. per kilogram. An average rule is to give 15 c.c. per pound weight of the child or infant.

Signs of hypertransfusion are cough, increased respiratory rate, quick thready pulse, and in older patients precordial pain, backache, and pain in the legs. In hæmorrhage neonatorum, 30 to 50 c.c. of blood is enough. The author's conclusions as regards the general indications for transfusion are those usually accepted.

C. K. P. Henry

Study of Transfused Blood: (a) The life of the transfused red blood corpuscle. (b) Blood destruction in pernicious anæmia. Ashby, Winifred. Jour. Exper. Med., August, 1921, vol. 34.

(a) The life of the transfused red blood corpuscle.—The elimination of the transfused blood is not a continuous process but takes place in more or less cyclic crises, which depend upon the cyclic activity of the body and not upon the condition of the transfused corpuscles. The physiological destruction of the red cells in animals is accomplished by specialized fixed tissue phagocytes, confined largely to the liver and spleen In man these are few. In man fragmentation of the red cells occurs in the vessels and the fragments are filtered out by the spleen.

In healthy individuals the red corpuscles transfused are eliminated in from 33 to 100 days (8 cases) A normal person eliminated transfused blood in 28 to 30 days, and a fatal long standing infection case showed no definite sign of elimination of the transfused blood after 46 days.

The periodic drop in the count of transfused blood is accompanied by an increased marrow activity, evidenced by a total red cell increase In women these drops are related to the menstrual cycle In pernicious anæmia the group IV transfused blood has remained in face of destruction of patient's corpuscles and even of transfused blood of the same blood group in two of the cases examined.

(b) Blood destruction in pernicious anæmia.—It is usually considered that increased blood destruction causes pernicious anæmia, not deficient blood formation. This assumption rests on (a) increased hæmosiderin, (b) increase in bile pigment output, (c) rapid falls in blood count, (d) and anæmia in face of a hyperplasia of the bone marrow. This was not confirmed by the author's results of observation in group IV blood transfusions. There is no experimental proof of the lower resistance of the pernicious anæmia corpuscle. Clark and Evans show some experimental evidence that in pernicious anæmia there is a reduction in the protective power of the serum for the corpuscles in the blood vessels against sodium oleate. Thirty-three cases of pernicious anæmia were transfused by group IV blood. In 4 pernicious anæmia cases elimination was as follows: complete, or almost so, in 91 days and in 100 days; and not complete in 100 days and in 83 days. In one case (100 days) the transfusion brought about a remission lasting for over a year.

There is no difference in pernicious anæmia in the elimination of group IV blood over that seen in the normal blood-disease-free cases, and the majority do not show any drop as great as in normal cases. The stability of transfused blood in pernicious anæmia cases is to be especially noted, and differs from the elimination in other conditions, for example, hæmolytic jaundice, aplastic anæmia, myelogenous leukæmia and secondary anæmia. Two cases showed rapid elimination of the same group blood cells and retention only of group IV blood corpuscles. Another case showed that the reverse occurred. One case showed group IV transfused blood eliminated in 2 days, and patient's own blood was unaffected. As a rule group IV blood corpuscles in pernicious anæmia are not eliminated as rapidly as in normal persons. No proof is adduced to show that group IV blood is consistently better or lasts longer than like-group blood. Clark and Evans show a marked reduction in the hæmolytic inhibitory powers of the serum of pernicious anæmia cases to a point markedly below that found in normal serum. The conclusion of the author is that blood destruction is not as important in pernicious anæmia as formerly considered. Charles K P. Henry

Chronic Arthritis with Lambliasis. Duodenal Biliary Drainage. Lyon, B. B. V., assisted by Bartle, U. J., Ellison, R T., and Richardson, R. Med. Clin. North Amer., January, 1921, vol. 4, page 1153.

The case report is given of a man of 59 affected with chronic arthritis. In a search for the cause of probable infection duodenal fluid was removed according to Dr. Lyons' method as described in the American Journal of the Medical Sciences, October, 1920.

Exfoliated and degenerated duodenal cells were removed with enormous numbers of Lamblia (perhaps better called Giardia) intestinalis, together with an unusually heavy growth of b. coli in pure culture. From the latter a vaccine was prepared and administered The patient was disinclined to have arsphenamine used in the treatment of his lambliasis, so continuous biliary drainage with duodenal and jejunal disinfection was substituted (by duodenal tube). This method did not in the end prove successful in removing the lamblia from the duodenal fluid, though as a result of the combined treatment the arthritis rapidly improved.

Dr Lyons believes that the lambliasis did not probably cause arthritis, although it may have aggravated it. He draws attention to the great possibilities of intermittent or continuous drainage of the duodeno-biliary system

J A Nutter

Joint Range. Robinson, William H. Jour. Orthop. Surg., February, 1921, vol. 3, page 41.

In the movement of an extremity the two most important factors involved are power or amount of force present and the amplitude or range of motion. To measure power the methods of Drs. Lovett and Martin are probably the soundest, but it is with the measurement of the range of motion that the writer is concerned. An instrument of the author's invention is described and illustrated, made of metal and of the protractor type with jointed arms.

The instrument is attached above the elbow, for example, and the range of movement read off on the scale as the joint is moved. Notes are given on the visual range of joint movement, and the application thereto of the author's instrument. A number of illustrations are appended of the motion possible in various joints.

J. A. Nutter

Inequality of the Lower Extremities Following Fracture of the Shaft of the Femur in Children. Truesdell, E. D., Ann. Surg., October, 1921, vol. 74, page 498.

Five cases of fracture of the shaft of the femur in children, whose ages ranged from 5 to 14, are cited where shortening averaging one-half inch existed at the termination of treatment.

On subsequent examination after a period of months or years there was found in the injured bone an actual lengthening averaging over five-eighths of an inch. The growth in the injured bone occurred in fractures treated by open and by closed methods and seemed to be uninfluenced by the site of the fracture, the series including fractures of the upper, middle and lower thirds.

From these observations it is concluded that a moderate degree of shortening due to over-riding in cases of fracture of the shaft in children is of less significance than the corresponding injuries in adults, and that the possibility of post-traumatic acceleration in growth should be borne in mind before undertaking radical treatment to correct over-riding in these fractures in children.

F J. Tees

Non-union of Fractures in Lower Third of Tibia. Eliason, E. L. Surg., Gynæc. and Obstet., November, 1921, vol. 32, page 551.

The high incidence of non-union in fractures of the lower third of the tibia is due to interference with the blood supply to the lower fragment.

The nutrient artery enters the upper third of the tibia and is consequently cut off in these fractures, leaving the nutrition of the lower third to be derived from the anterior tibial artery through small periosteal branches. This artery lying in an exposed position may be damaged at the time of the original injury or at a later date by methods of forcible reduction; thrombosis may occur or the circulation may be interfered with by the swelling.

Prolonged elevation may operate the same way with consequent delay in repair. Hence care must be taken to minimize trauma during manipulation and the limb should be lowered at the earliest possible moment.

F. J. Tees

Fractures of Transverse Processes of the Lumbar Vertebrae. Davis, G. G. Surg., Gynæc. and Obstet., September, 1921, vol. 32, page 272.

Many cases diagnosed as "sprained back" and "malingering" are due to unrecognized fractures of the lumbar transverse processes, which are revealed by improved x-ray methods.

The symptomatology of these cases is definite; pain in the back, "backache," which is well localized, constant, does not radiate, and increases with movement of the spine. Muscular rigidity and a point of exquisite tenderness over the fractured process are noted.

The injury is due to indirect violence and is brought about by force applied to the quadratus lumborum muscle when the thorax, spine and pelvis are fixed. The details of this mechanism are discussed.

The condition is often associated with osteoarthritis. The average age of eight patients, of whom x-rays are reproduced, was 40 years, beyond the age when separation of the secondary ossific centers would be expected

F. J. Tees

ANAESTHESIA

A Study of the Anurias Occurring in Normal Animals During the Use of the General Anæsthetics. McNider, William deB. Jour. Pharmacol. and Exper Therap., June, 1920.

McNider used ether, chloroform and Grehant's anæsthetic. He studied 131 normal dogs.; 43 became temporarily or permanently anuric, 98 received, at some period, one or more diuretic solutions. Of the 43 he selects 9 as representative of the group.

He describes the detailed technique of the experiment and shows a masterly, careful control.

Renal tests were made with phenolsulphonephthalein and alkali reserve of the blood was determined by Marriott's method. The duration of anæsthesia was not over two and three-quarter hours in any one case. Blood pressure was taken and the urine flow noted. At the end of the first hour of anæsthesia 0.9 per cent. solution of sodium chloride or 1 per cent. solution of theobromine was given to increase or re-establish the flow of the urine

A study of his illustrative table is very instructive.

He gives the details of the pathology of the kidneys in these experiments and reports the injury to these organs much more marked in cases of chloroform and Grehant's anæsthetic than in those of ether.

He finds that anurias in etherized animals occur late in the experiment and are associated with a fall in blood pressure without depletion of the alkali reserve; in these the use of diuretic solutions re-establishes the flow of urine. Animals anæsthetized by chloroform or Grehant's anæsthetic show early a more marked fall in blood pressure than those anæsthetized by ether. The flow of urine is more reduced than it is with ether, anuria develops earlier and all show a depletion of the alkali reserve and even if diuretic solutions raise the blood pressure, the flow of urine will not return. Anurias occurring in normal animals during an anæsthetic have been associated with either a low blood pressure or a depletion of the alkali reserve of the blood and anuria with low blood pressure and with a normal alkali reserve will be relieved by diuretics, one, however, with reduction of the alkali reserve of the blood is unaffected by such solutions.

He suggests that prior to the use of an anæsthetic, even in normal animals with normal urine and normal elimination of phenolsulphonephthalein an alkali should be employed to prevent the development of that group of anurias which is characterized by a marked reduction in the alkali reserve of the blood and which are unaffected by diuretic solutions.

Wesley Bourne

Eleven Thousand Cases of Spinal Anæsthesia. Morrison, Arthur A. Brit. Med. Jour., November 5, 1921, page 745.

Morrison has done 11,000 surgical operations under stovaine in ten years.

He uses a platinum needle about 2½ inches long and of about the same thickness as a hydomermic needle.

The stovaine solution is made up in ampoules (furnished by Maison Clin of Paris) containing 7½ c.cm. To this the writer adds an ampoule containing ½ minim or 1 minim of liquor strych.

He uses spinal anæsthesia for all abdominal operations, including hysterectomy, ovariotomy, appendectomy, nephrectomy, liver abscess and for thoracic operations such as empyema, thoracotomy, necrosis of ribs or clavicle.

He graduates the dose to a certain extent, according to the probable duration of the operation.

The one real disadvantage is headache. He finds that this generally occurs after minor operations and is largely due to the fact that the patients will sit up and jump about in bed. There is no headache when they keep quiet.

W. B. Howell

RADIOLOGY

Syphilis of the Lungs: Its Radiographic Findings and Their Pathologic Basis.

Golden, Ross. Amer. Jour. Roentgenol., September, 1921, vol. 8, page 502.

This article treats of the incidence, pathology, radiographic findings and diagnosis of the condition, with a report of three cases, referring to the work done by Carrera and others.

Syphilitic infection of the lungs is not a common disease, but there can be little doubt that it does occur and that it is mistaken for other pulmonary diseases. It is hoped that incontrovertible histological proof may be furnished by the demonstration of the treponema pallidum in pulmonary lesions as it has been in the aorta and the brain.

Radiographically, three types are distinguished: (a) gumma with peribronchitis; (b) syphilitic fibrosis; (c) broncho-stenosis.

1.—Gumma with peribronchitis. This type varies with the progress of the disease. In the early stages the bronchial markings show small knobby enlargements due to peribronchial gummata; later these increase in size and in number, and scar formation is present showing as linear shadows radiating from the hilus or the pleura with contraction of the lung and retraction of the mediastinal contents and increasing pleural involvement. It tends to develop in the lower portion of one lung, generally the right The shadow of the gumma is rather irregular in outline, poorly defined, and when cicatrized, radiating or stellate, and rarely, if ever, calcified.

2.—Syphilitic fibrosis This is a rather diffuse increase in the bronchial shadows without gummatous enlargement

3.—Broncho-stenosis The result of stenosis of a bronchus is the collapse of the lung, followed by extreme pathological changes. There is absolute dulness involving one side with marked retraction of the heart and mediastinum to that side

Diagnosis. The diagnosis must depend upon the facts available from the history, physical examination and laboratory findings. The affinity of tuberculosis for the upper part of the lungs and its tendency to be bilateral are well known. Resolving or unresolved pneumonia, malignancy and massive collapse of the lung of traumatic origin may cast shadows indistinguishable from those of lung syphilis

Summary.—The following points may be worthy of mention Syphilis prefers the lower part of the lung, seldom involving the apex The process is apt to be more marked around the hilus, progressing along the bronchi towards the periphery It tends to develop unilaterally and may destroy completely the function of one lung, involving the other comparatively little or not at all. It involves the pleura extensively and causes a marked connective tissue reaction, producing radiating or stellate scars which may be very extensive and which calcify rarely. Three general types of roentgenograms may be expected based upon the way in which the condition may develop pathologically.

The above article confirms the opinion held by the majority of radiologists associated with large hospitals, namely, that the occurrence of syphilis of the lungs is decidedly rare.

W. A. Wilkins

The Roentgenologic Aspect of Pulmonary Metastasis.

Carman, Russell D. Jour. Radiol., October, 1921, vol. 2.

The conclusions drawn from a study of 196 cases of pulmonary metastatic malignancy confirm those advanced in 1916 by the same author who reported seventy cases at that time, namely,

1.—Pulmonary metastatic malignancy may occur regardless of the seat of the primary focus. 2. It bears no relationship to the extent or duration of the primary disease. 3. It can be discovered in many instances only by roentgen examination; and 4. the character of the primary growth cannot be predicted from the roentgenogram.

Three types of metastases are described—nodular, miliary and infiltrative. The nodular type is characterized by the sharply outlined border of the nodule, their multiplicity and the involvement of both lungs. The miliary type exhibits showers of small, discrete areas of increased density and presents difficulties in differential diagnosis. The infiltrative type is rare. The differential diagnosis is outlined between pulmonary malignant metastasis and Hodgkins' Disease, cysts, interlobar effusions, calcium metastasis, syphilis, pulmonary abscess, miliary tuberculosis and pneumonokoniosis.

A. S. Kirkland

Roentgen Ray Treatment of the Eczema Group.

Eichenlaub, F. J. Amer. Jour. Roentgenol., September, 1921, vol. 8, page 520.

This is a study of one hundred cases in which the chief reliance in treatment has been the x-ray, and the cases were followed sufficiently long to draw conclusions. Nine of these cases were cases of definite neuro-dermatitis with the typical clinical distribution of the lesions and in all of which a clear history of mental stress had preceded the attack. The remaining ninety-one cases ranged from small patches of dermatitis on the hands, due to external irritation, to extreme cases of generalized eczema, probably chiefly due to internal factors.

The x-ray treatment consisted in the administration of approximately one-half H.skin units every two weeks over all affected areas. The technique was 4 M A 7½ inches S G 9-inch focal skin distance and 35 seconds for each application. In exceptional cases slightly smaller doses were administered every ten days The number of treatments required to clear up the condition varied greatly, and in many cases had little relation to the duration of the disease. The cause, whether internal or external, played little part in the result of treatment. In general, the results were better with x-ray treatment than by any previously known method of attack. Frequently, to test the effectiveness of treatment, only a part of the affected skin was treated with the x ray. Ten days later the part treated was from fifty to one hundred per cent better than the part treated by other methods.

In this series of one hundred cases, the average number of treatments per case was about three, There were two cases which did not respond at all to treatment, and two in which there was only temporary benefit. A case is considered to be cured when objective symptoms have entirely disappeared for several months and have failed to reappear within the usual time of recurrence for that particular case when more than one attack has been present. The average time required to cure is approximately two months. W. A WILKINS

MEDICINE

Pseudotumours of the Brain. Rows, R. G. Jour. Amer. Med. Assoc., November 19, 1921, page 1643.

Rows quotes Hughlings Jackson's and Oppenheimer's accounts of cases presenting symptoms of brain tumour, with negative findings at autopsy. In Rows' patient, an ex-soldier, was noted a combination of striking psychic, neurologic and autonomic symptoms. Among the psychic were stupor, confusion hebetude, acute depression, epileptic attacks.

Neurologic symptoms included difficulty of speech, tremors of arms and legs alternating with slow stiff movements, difficulty in walking, namely stumbling and crossing of the legs; altered and variable reflexes, the Babinski sign being sometimes present. Among tbe autonomic were diffuse œdema of the skin of the head and neck and dilatation of the vessels, with cold and blue extremities. The pupils were sluggish and unequal, the tongue was furred, and there was incontinence of urine and fæces.

The patient stated that he could not control his mind, that he had unpleasant dreams, was confused, and that incidents of the war associated with emotions of horror came vividly before his mind. Later on he described having suffered field punishment No. 1., *i.e.*, tied to wheel of a gun seven days for getting drunk.

The duration of the stuporous attacks increased, and the depression, convulsions, and other symptoms continued for several months. The psychogenic nature of the mental and physical disorders became evident, and under psychic treatment the symptoms gradually cleared up.

In discussing the diagnosis, Rows states that for a long time diagnosis was impossible. In the earlier stages the symptoms pointed to brain tumour, possibly in the frontal region, but further observation showed this to be improbable.

At the same time he maintains that there was probably some organic disturbance of the nervous system, and cites cases of pseudo-tumour cerebri in which localized œdema was found post-mortem, and experiments on dogs and rabibts in which intense vaso-motor disturbance and œdema of the spinal cord and inflammatory changes in some of the abdominal ganglia resulted from placing a culture of staphylococcus pyogenes aureus within the abdominal cavity. In the above described case he considers it possible that the combined disturbances of the sympathetic and autonomic systems and of the endocrine glands led to a slight but recoverable primary degeneration of the nervous structures, as these different systems normally react upon one another. But, he says, all the symptoms of the case, taken together, indicate an alteration in the functional activity of the whole organism.

Disturbances of the sympathetic and autonomic nervous systems and of the endocrine glands can affect the mental mechanisms, and also the organs of the body can be influenced by changes which accompany mental states. It is possible therefore that the physical changes suggested as having occurred in the central nervous system may be the result of psychic activities, and that these changes are really secondary effects and not original causes.

Repetitions of war memories associated with emotions of horror, spread over a considerable time, led to the development of a series of conditioned reflexes so that special mechanisms were facilitated and others inhibited.

A. G. MORPHY

Treatment of Scarlet Fever with Immune Human Serum. WEAVER, G. H. Jour. Amer. Med. Assoc., October 29, 1921.

THIS method of treatment has been in use for more than twenty years; the early results were unsatisfactory, but with improvements of technique the more recent reports have been uniformly laudatory. Its use is especially advised in severe cases, and is claimed to improve the general condition, shorten the course of the fever, and greatly lessen the mortality.

The writer advocates obtaining the blood from convalescents during the fourth or early in the fifth week. The donors should be robust, free from any suspicion of tuberculosis and syphilis, and should have passed through a typical attack of scarlet fever without septic complications. The serum is separated and either used immediately or preserved with 0.3 per cent. tricresol until required. Its efficacy apparently decreases on keeping. Sixty to 90 c.c. are injected intramuscularly as early in the disease as possible, the best results being obtained when given on the second day. Intramuscular injections of citrated whole blood may be used as an alternative.

The writer reports the use of the convalescent serum in 51 toxic cases, with almost invariably beneficial results.

H. B. CUSHING

Hemihypertrophy and Mental Detect. GESELL, ARNOLD. Arch. Neurol. and Psychiat., October, 1921, vol. 6, page 400.

HEMIHYPERTROPHY is a unilateral enlargement of one side of the body, and is one of the rarest among developmental anomalies. A case associated with mental deficiency is described. Physical and mental measurements were made when the subject was 13 years old and repeated at the age of 20.

A comprehensive tabulation of cases to date (Table 3) shows a total of forty cases recorded in medical literature, of which nineteen were male, twenty-seven on the right side, nineteen with skin complications and five with mental defect.

A less complete tabulation of partial and crossed hypertrophies, including thirty cases, is presented for comparison in Table 4. In a discussion of the etiologic theories for hemihypertrophy, preference is given to the view that hemihypertrophy is not a hereditary character but a morphogenetic anomaly dating back to an early embryonic stage.

Hemihypertrophy is interpreted as a form of asymmetry due to a possible deviation in the normal process of twinning.

The complication of mental defect is attributed to an abnormality in the process of bilateral twinning which involves a disturbance of normal tissue development.

Possible relations of certain cases of mental defect to cranial asymmetry and intra-uterine meningitis are suggested. The value of further biometric and clinical studies in asymmetry is indicated. C. K. RUSSEL

Comparative Results of Colloidal Mastic and Colloidal Gold Tests. KEIDEL, ALBERT, AND MOORE, JOSEPH EARLE. Arch. Neurol. and Psychiat., August, 1921, vol. 6, page 163.

ALTHOUGH the colloidal mastic test, first introduced by Emmanuel, and later modified by Cutting, has been in limited use, the question of its value compared with that of the colloidal gold test is still an unsettled one. It has much, however, to recommend it in the less complicated and more certain methods of preparing the reagents, and the mastic reaction itself is said to be more simple and uniform. In order to show that the information provided by the mastic test is equivalent to that got by the gold test and in some cases provide information which the gold test fails to give, the authors studied the spinal fluid of 311 patients, making comparisons with the two methods. The material was made up almost entirely of cases of syphilis, with a control of a small number of non-syphilitic patients.

The technique employed in the mastic test is that described by Stanton in the *Archives of Neurology and Psychiatry*, vol. 4, page 301, of September, 1920. It is essentially as follows: Ten grams of commercial gum mastic are dissolved in 100 cc. of absolute alcohol, and the resultant cloudy fluid filtered several times until a clear straw-colored solution is obtained. This stock solution is kept in glass stoppered bottles at room temperature. The emulsion is prepared with 1 c.c. of the stock solution added to 9 c.c of absolute alcohol, which is then added, with gentle mixing, to 40 c.c. of once distilled water.

In setting up the test ten small tubes are employed. To the first tube in the series are added 1.5 c.c. of a stock salt solution (99 c.c. of 1.25 per cent. sodium chlorid solution plus 1 c.c. of 0.5 per cent. potassium carbonate solution), and to each of the remaining tubes 1 c.c is added. In the first tube there is placed 0.5 c.c. of the spinal fluid to be tested. After mixing this dilution of spinal fluid, a titration is made throughout the series by transferring 1 c.c. from the first to the second tube, from the second to the third, etc., 1 c.c. being finally discarded from the last tube. Finally, 1 c.c. of the mastic emulsion is added to each tube. After mixing, the tubes are allowed to stand over night at room temperature, and the results are read in the morning. No special precautions regarding absolute cleanliness of glassware, such as are necessary for the gold test, need be observed.

By observing the reactions obtained in a number of fluids in parallel series of gold and mastic tests the following scale was arrived at: 0, opalescence, no change; 1, milky fluid with no precipitation; 2, milky fluid with slight precipitation; 3, milky fluid with moderate precipitation; 4, cloudy fluid with almost complete precipitation; 5, clear fluid with complete precipitation. With this scale mastic reactions recorded as 2 may occur in normal fluids with about the same frequency as in the gold test, and such reactions are therefore regarded as within normal limits. Fluids which produce moderate precipitation, however, as denoted by reading 3, are to be tentatively regarded as abnormal and to be regarded as a syphilitic zone curve.

The results obtained show that there is a fairly close parallelism between the colloidal gold and the colloidal mastic tests; and that when agreement is lacking, the mastic test seems to detect abnormalities more frequently than does the gold. This fact, and the simplicity of performance of the mastic test, lead the authors to conclude that the test should be an indispensable part of the routine of spinal fluid examinations. C. K. Russel

Focal Infection (in Certain Skin Diseases). Roberts, H. Leslie. Brit. Jour. Dermatol., October, 1921, vol. 23, page 319.

This is a paper dealing with the, at present, much discussed subject of the occurrence and persistence of certain chronic skin diseases attributable to tonsillar and nasopharyngeal infection. The cases in this series include alopecia areata, lupus erythematosus, lichen planus, urticaria, prurigo and psoriasis. The offending tonsils need not necessarily be enlarged; in fact the small fibrous variety containing septic crypts are the type more frequently met with. The organism isolated is in the majority of cases the streptococcus longus. Treatment consists in tonsillectomy combined with injections of an autogenous vaccine prepared from the enucleated tonsils. Philip Burnett

Blood Changes in a Gastrectomized Patient, Simulating Those in Pernicious Anaemia. Hartman, H. R. Amer. Jour. Med. Sci., August, 1921, 162:201.

The author reports a case in which a blood picture typical of pernicious anæmia developed after gastrectomy. A male patient had a complete removal of the stomach for carcinoma. During one year after operation he was well. Twenty-one months later he returned complaining of anæmia and loss of weight. A blood count showed 2,000,000 red cells, 2,200 white cells and 55 per cent. of hæmoglobin with poikilocytosis and some stippling. At the end of a subsequent year the number of red cells was 1,420,000 and Hgb. 34 per cent. Considering the deficiency of gastric ferments found in the stomach contents in pernicious anæmia the writer thinks the case reported suggests that this deficiency is the cause of the blood picture and that conclusions may be arrived at by work along these lines.

A. H. MacCordick

Study of Encephalitis Lethargica in Relation to Anterior Poliomyelitis. Neustaedler, Larkin and Banzhof. Amer. Jour. Med. Sci., November 1, 1921, Vol. 162, No. 5.

Investigations were made as to the effect of serum from convalescing encephalitis lethargica patients on the virus of poliomyelitis in vitro. (It has already been established that the serum from convalescent poliomyelitis cases neutralizes its virus of the same disease in vitro, and protects against infection.)

Monkeys were injected intracerebrally with a mixture of poliomyelitis virus and convalescent encephalitis lethargica serum, which mixture had been incubated several hours. At the same time control monkeys were injected, using a virus which had been subjected to the action of normal serum. Five out of seven of the test monkeys showed no effects, while in the control animals all developed paralysis. A. H. MacCordick

Book Reviews

THE STORY OF BURKE AND HARE— A REVIEW*

Burke and Hare Edited by William Roughead Demy 8vo, 280 pages, 13 illustrations. Toronto: Canada Law Book Company.

This latest addition to the notable British Trials series will revive interest in the story of these scoundrels who undertook deliberate murder for the money to be gained by the sale of bodies for dissection. Previous to the passing of the Anatomy Act of 1832, which regulated the supply of subjects for dissection, the medical schools of England and Scotland were to a great extent dependent upon the activities of the resurrection men, supplemented by the energetic efforts of keen medical students and junior surgeons. Bransby Cooper's life of Sir Astley Cooper deals very fully with the subject, and he relates many anecdotes of Sir Astley and his relations with the resurrectionists. It is said of Robert Liston that as a student he was as bold and successful a body snatcher as he afterwards became a surgeon. Dr. Knox had rapidly attracted attention as a brilliant lecturer in anatomy and surgery, and his extra mural lecture room was crowded with eager students while Munro Tertius the University lecturer was addressing dwindling classes. In 1828 over 500 students registered with Knox and the need for bodies became so great that Scotland could not satisfy them and bodies were shipped from England. Burke, a drunken Irishman, ran a low cheap lodging house, and one of his lodgers dying with an unpaid debt to his landlord, the body was taken by Burke and his companion Hare to Knox's dissecting room. They received £7 10s. and were told to bring more. Tempted by easy money they smothered a man who was a lodger of Hare's who fell ill. For this body they received £10. Their confessions tell of some sixteen murders committed by them during the next nine months before being brought to justice. Knox's failure to raise any question as to the source of these unburied bodies bought by him left a stain upon his name which time cannot remove, and the fury of the populace was so great that he was forced to leave Edinburgh. His brilliant career came to a sudden end and he eked out a precarious livelihood in and about London for the remainder of his days. Hare's wife and Burke's paramour McDougall must have been accessories to many of the murders, but both escaped the clutches of the law, and Hare becoming King's evidence was given his freedom. The trial caused great excitement in Edinburgh and the principals had narrow escapes from the wrath and indignation of the citizens. "Burking" was a word coined at this time which has still a place in our English vocabulary, and as Mary Paterson was one of their victims, we wonder whether the catch phrase often heard fifty years ago, "who struck Mary Paterson?" also had a similar origin. Wharton Jones and Sir William Fergusson, later president of the Royal College of Surgeons of England and Sergeant Surgeon to Her Majesty, were assistants to Knox at the time and did not altogether escape the shadow of the scandal. The Anatomy Act of three years later put a stop to the work of the body snatchers. Their work about Edinburgh has been described in "The Life of Sir Robert Christison" (1885) who was a student at the time and had first-hand knowledge. Sir Walter Scott and R. L. Stevenson have used the resurrectionists in their stories, and from Bransley Cooper we learn what fortunes were made by some of the most outstanding characters who devoted themselves to this ghoulish work. Mr. Roughead's work contains a chapter on the resurrectionists and gives the story of all the Burke and Hare murders, as related in their confessions and as gleaned from contemporary literature, which was of enormous proportions. In addition to much other matter, the legal proceedings are given verbatim. J. H. Elliott

Chemical Disinfection and Sterilization. S. Rideal, D.Sc., and E. K. Rideal, D.Sc., M.A. Pages vii, 313. London: Edward Arnold, 1921.

This book is a mine of information on every type of chemical disinfection. Chapters are devoted to the disinfection of air, of water, of rooms and of persons. The preservation of food, of wood, the killing of plant and animal parasites and even of weeds in a lawn are discussed. Useful chapters describe the chemicals, inorganic and organic, employed in all these processes of disinfection and discuss the theory and practice of their employment. The journal literature is sufficiently given to serve as a source of fuller information on any of these subjects. A final chapter discusses the bacteriological methods of standardizing disinfectants, including of course the well-known method of Rideal and Walker. In reading the book one feels a lack of critical acumen and one notices that there is no clear appreciation of the varying sensitivity of different species and indeed of different races of bacteria to different chemicals. A chapter on "What is one bacteria's meat is another's poison" in its modern dress would be of great value. As a reference book this work will prove very useful. V. E. H.

Medical Electricity, Roentgen Rays and Radium. With a practical chapter on Phototherapy. By Sinclair Tousey, M.D., consulting surgeon to St. Bartholomew's Clinic, New York City. Third edition. thoroughly revised and greatly enlarged. Octavo of 1337 pages with 861 practical illustrations, 16 in colours. Philadelphia and London: W. B. Saunders Company, 1921. Cloth, $11.00 net. Sole Canadian agents, the J. F. Hartz Company, Limited, Toronto.

This is the third edition of a work which is now regarded as a classic work of reference, particularly upon the application of electricity to medical uses.

The first part of the book is taken up with a very full description of electric currents, their physiological effects and modes of application and measurement. As a reference work this is invaluable, but is rather too full for general reading.

There is a much-needed chapter on photo therapy, giving a very practical exposition of this subject in compact form. This chapter provides the general reader with most of the information he requires upon the subject, while at the same time the special worker may find sufficient detail to enable him to apply the methods described.

The remainder of the book is taken up with x-rays and radium, these chapters having been brought up to date. Much of this matter is now of historic interest, as instanced by the colour plates of gas tubes in operation

No one now judges the condition of a gas tube by its colour even if he still uses one at all. There is, however, a great fund of information which is not equalled by any other book in English upon these subjects. The book will still find its chief field among those who seek special reading upon many of the scientific aspects of these various matters. G. E. R.

Transactions of the American Surgical Association. Vol. 38. Edited by John H. Jopson, M.D., Recorder of the Association Printed for the Association. For sale by William J. Dornan, Philadelphia, 1920.

This volume comprises the various contributions made to the Association at its Philadelphia meeting in 1920. The first seven papers deal with the subject of empyæma, and are presented by such well-known surgeons as Tuffier, Ashhurst, Bunts, Martin, Davis, Lilienthal and Heuer. Six articles from the pens of Crile, Freeman, Mayo, Terry, Judd and Porter refer to various aspects of the goiter problem. Among the many other subjects treated are exceptionally interesting articles on "Diverticula of the œsophagus" by Bevan, "The calloused ulcer of the posterior wall of the stomach" by W. J. Mayo, "Mesenteric thrombosis" by Ross, "The recognition of dead bone, based on pathological and *x*-ray studies" by Phemister," and "One year's work in hysterectomy, including the writer's experience with radium in uterine conditions" by Deaver. The latter voices his well-known views concerning radium, and pleads for a somewhat less enthusiastic belief as to the curative value of this agent.

While many of the articles have already appeared elsewhere the volume gives an exceedingly interesting birds'-eye view of the present-day status of surgical thought and opinion, and its perusal cannot fail to afford the reader much valuable information, as well as stimulate his enthusiasm and ambition by the records of results achieved. E. R. S.

Clinical Study and Treatment of Sick Children. By John Thomson, M.D., F.R.C.P. Edin., consulting physician to the Royal Edinburgh Hospital for Sick Children; formerly lecturer on the diseases of children, University of Edinburgh. Third edition, re-written and greatly enlarged. 842 pages, with 249 illustrations. Oliver and Boyd, Edinburgh and London, 1921.

The author deals with the subject of diseases of children from a clinical point of view, discussing laboratory investigation of cases in a general way only. Infant feeding is discussed concisely, using the physiology of the gastro-intestinal tract as the basis for correction of disorders due to food The last 20 pages of the book are set aside for detailed discussion of certain subjects referred to in the text, *i.e*, method of case taking; vitamines; instructions to mothers with respect to paralysed children, etc Throughout the book are numerous references to other texts and to current literature from all centres. The style is clear and the grammatical construction is perfect. Illustrations are numerous and well chosen. A good book for practitioners A. B.

The Effect of Certain Agents on the Development of Some Molds. K G Bitting. National Capital Press, Washington, D C, November, 1920 Pages 1-17[illegible], including 62 plates

The molds used (Penicillium expansum Link, alternaria solani E. and M., Jones and Grout, Oidium lactis Fresenius) were grown on tomato bouillon The effect of the various agents tested was noted on the period required for the germination of conidia, the extent of growth in a definite period, the form of growth the formation of conidia, the time for maturation as evidenced by the chromatic changes and any irregularity in form, colour or extent. The agents tested (62 in all) included salt, sugar, common spices, vegetable acids, alcohol, formaldehyde, hydroxide, lead acetate, sulphuric acid, potassium hydroxide, atropin, sulphide, mercuric acid, etc.

The effects produced indicate that the molds used possess great adaptability and resistance to adverse conditions. J. G. F.

Autoerotic Phenomena in Adolescence. By K Menzies. Second edition; 100 pages. Price 5s. net. H. K. Lewis & Co., Ltd., 136 Gower Street, London, W.C.1.

This little book on masturbation is written from the standpoint of the psychoanalyst and the development of the habit is traced carefully from childhood, and considered from the psychological, pathological and ethical standpoint. The treatment is handled with care, and the clergy are advised how to manage cases properly. Reassurance and not condemnation is good therapeutics; over-emphasis is unwise, but sudden cessation is inadvisable. The small volume is useful for the physician and the clergyman but is not suitable for the patient. G. W. H.

The Clinical Examination of the Nervous System. By G. H. Monrad-Krohn, M.D., (Christiania) Pages, xvi and 135, 12 illustrations. Price 6s. net. H. K. Lewis & Co., Ltd., 28 Gower Place, London. W.C.1.

This little book of 129 pages on the examination of the nervous system is one of the most satisfactory manuals that has ever been published. and is most useful for students and for those practitioners that have not their methods of examination always in active use.

There is a short chapter on the reflexes of spinal automatism that is not usually found in text books, and makes the book of unusual interest; and while the rest of the volume is the collation of the more ordinary forms of examination, yet the form of their description is both accurate and interesting. G. W. H.

The Hot Springs of New Zealand. By A. S. Herbert, M.D., O.B.E., Pages xiv, 284, illustrations 87, maps 3. Price 15s. H. K. Lewis & Co., Ltd., London, 1921.

This beautifully written and superbly illustrated book makes one long for the opportunity to visit the famous hot springs and geysers of the "thermal district of New Zealand." Could one present this book to a wealthy patient he would fly to this land of wonders and health. The pictures of the baths at Rotorua cause one to wonder why our mineral springs have not been developed. The discussion of the principles of balneology and of the uses of the various mineral waters and mud baths are clear and scientifically written. All together the book is a credit to both author and publisher. V. E. H.

Infections of the Hand. A guide to the surgical treatment of acute and chronic suppurative processes in the fingers, hand and forearm. By Allen B Kanavel, M.D, assistant professor of surgery, Northwestern University Medical School, attending surgeon, Wesley and Cook County Hospitals, Chicago Fourth edition, thoroughly revised, illustrated with 185 engravings. Lea and Febiger, Philadelphia and New York, 1921. Price $5.50 net

This volume presents the most complete, comprehensive and exhaustive survey of infections of the hand that has so far been published in the English language. In the opening chapter reference is made to the history of the evolution of our knowledge of these conditions and of their proper treatment, and from this to the final chapter on restoration of function every angle is thoroughly and scientifically considered, always with the viewpoint of proper treatment in mind.

The author's division of types of infection into simple localized, and grave, and the subdivision of the latter into acute lymphangitis, tenosynovitis, and fascial space abscesses is admirable, and lends itself well to the development of the proper mental picture of the pathological processes at work. The illustrations are numerous and excellent, and great stress is laid on the proper position and length of incisions for the relief of the various types of infections.

From a practical standpoint the only criticism one can offer is that the work is too exhaustive for the average reader, with the result that the main and fundamental ideas tend to become obscured by attention to a mass of detail. E. R. S.

Essays on Surgical Subjects. By Sir Berkeley Moynihan, K.C.M.G., C.B., Leeds, England. Octavo of 253 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1921 Cloth, $5 50 net. The J. F. Hartz Co, Limited, Toronto.

Nine of the distinguished author's valuable contributions to surgical literature are here presented in collected form so that as he remarks, "It presents a consecutive train of thought and experience for final judgment." The several essays cover surgical operations in general, the surgery of the abdomen with special reference to the acute emergencies, and to the surgical diseases of the stomach, and the surgery of the chest. The first "Murphy memorial" oration is also included. The statistical figures have been brought up to the end of the year 1920.

Those who are well acquainted with Moynihan's teaching will welcome the opportunity of having these various articles collected in one volume, and any student of medicine who has not read his works will be incalculably benefitted by a perusal of these dissertations by a past-master not only in the art of surgery but also in the command of the English language. E. R. S.

Lectures on the Surgery of the Stomach and Duodenum. By James Sherren, C.B.E., F.R.C.S., Surgeon to the London Hospital. Published by H. K. Lewis and Co., Ltd., 28 Gower Place, London, W.C.1. Size cr. 8vo., 96 pages. Price 4s. 6d. net.

In this little volume the author covers the surgery of the stomach and duodenum admirably, and its perusal will well repay every student of this subject. His conclusions are evidently based on a wide personal clinical experience, and are couched in most clear and concise language. After reading this work one cannot but conclude that the value of a book is by no means dependent on its size, and to express the regret that so many authors deem it necessary to encumber their volumes by useless padding thereby causing distinct loss of time and patience to their readers. The author lays stress on the serious nature of ulcer of the stomach, and expresses the idea that the prophylaxis of carcinoma of this organ rests largely in the proper treatment of ulcer. E. R. S.

International Clinics. Thirty-first series, vol. 3, 1921. Edited by H. R. M. Landis, M.D., Philadelphia, U.S.A., with medical and surgical collaborators in United States, England and Canada. J. B. Lippincott Company, Montreal, Que Price $2.50 per volume or $10.00 for the series of four.

Although the outstanding feature of this volume is an admirable symposium on actinomycosis, covering many of the organs and tissues which may be involved, the departments of medicine, pædiatrics, industrial medicine and surgery are represented by excellent and most readable articles. In surgery such practical subjects as fractures of the lower end of the radius, the radical cure of hydrocephalus, fractures of the skull, the acute abdomen and the surgical kidney are discussed by authors who have succeeded in making a splendid presentation of their special subject. The articles in "Industrial Medicine" are principally surgical, though pneumonoconiosis and Hodgkins' disease are discussed as well as the organization of a medical industrial department. The illustrations are good and the volume is one which the general practitioner can read with much pleasure. J. H. E.

Medical Examination for Life Insurance. By Thos. D. Lister, C.B.E., M.D., F.R.C.S., M.R.C.P. 8vo, pages vii, 168. London: Edward Arnold & Co., 1921. Price 10s. 6d. net.

The author has based this work upon long experience as a physician and as the medical officer of large English assurance companies. It treats of the application of medicine to the business problems involved in life insurance. Mortality tables and actuarial work are not included. It is an attempt to make clear to the examiner his relation to the company and point out the essentials in an examination. It is pointed out that medical selection is only a part of selection generally, that many other factors are concerned in assessing the risk as average or otherwise, and that the head office often have additional information which may cause them to accept or alter the opinion expressed by the medical examiner. The medical examiner is usually asked to express his opinion of the risk on the basis of his physical examination alone. To form an opinion of value the examiner must know something of prognosis as well as of the value of physical signs of disease and of altered function. In the chapter on medical fees we learn that the British Medical Association through its representative body, in June 1920, made an agreement with the Life Offices' Association, fixing a scale of fees to govern its members. For industrial work up to £100 the fee is 10s. 6d., over £100, 21s., and for ordinary policies a flat rate of 21s., whatever the amount. In view of the endeavour being made by some of the profession in Ontario to secure an increase in the fee paid by standard companies, it is interesting to learn that the increase in the fee paid in Great Britain has been accompanied by an increase in the extension of non-medical examination business by standard companies; and further we read that it is a curious fact that questions as to the amount of fee are more often raised among practitioners who are only occasionally called upon to examine than by medical examiners who are men of considerable standing in the profession, and are often of the consultant rank. To make the book complete there is much that appears elementary, yet the book abounds in wise comment and mature opinion. It is an excellent manual for the physician who is taking up insurance work.

J. H. E.

News Items

ONTARIO

TO THE PROFESSION IN ONTARIO

More than one item has appeared in these columns setting forth the difficulties which confront a medical journal circulating in a country as small as ours, with such distinctly limited possibilities as regards the number of subscribers. It seems hardly necessary to call attention to the fact that journals such as *The Lancet*, *The British Medical Journal*, and *The Journal of the American Medical Association*, have subscriptions totalling many thousands, whereas the best ever to be hoped for in Canada can only be (at present at least) a medical journal with perhaps four or five thousand subscribers.

It is most essential on the other hand that the journal be one with proper ideals, and with a real knowledge of present-day medicine in all its many branches. Nothing else can ever appeal to the practitioner who is at all interested in the welfare and progress of the practice of medicine and its proper teaching. For this reason, the standard of the *Journal of the Canadian Medical Association* must remain high, and to keep this high standard it is perfectly apparent that the few thousand medical men in Canada must make the sacrifice of paying more for their *Journal* than would the many thousands in the bigger countries. It would be a simple matter to throw over all effort at medical journalism, and placidly to allow American and English journals to do the publishing of work produced in Canada. Such an attitude, however, would be at variance with that Canadian pride which sees every year better work and more of it coming from the pen of Canadian writers, and can never for a moment be entertained There must be published in Canada one real medical journal at least. To put the *Journal* on some more stable foundation seems at the present moment essential to a degree; the necessity for enlargement becomes more apparent each month; in the Ontario section alone there is an accumulation of papers sufficient for the next ten months at the present rate of publication, and it is to be remembered that institutions such as the General Hospital, The Academy, the Sick Children's Hospital, St. Michael's Hospital, the Western Hospital, and Grace Hospital in Toronto, rapidly re-organizing since the war, will soon contribute more than enough material to fill a whole monthly issue.

In spite of the opposition expressed in some quarters, it seems that the bond issue is the best method of meeting the difficulty which confronts the *Journal* in its endeavour to step forward to meet the growing demands of the profession The legality of issuing the bonds in Ontario has been considered, and on this point there is now no doubt. The next step is the putting of the matter before the profession as a whole. It is useless and unfair for the Provinces to criticize Montreal and its possessing the *Journal* with its machinery. The Editors and Board of Managers in that city have kept the light of journalism burning, not only in the long dark period before the war, but during the war itself, when the majority of the Editorial staff were doing duty with the Canadian Army in France and England. To them is owing every consideration and all our help in the endeavour to make a national journal They have given freely of their time and energy in a way that should command admiration instead of carping criticism, and if they fail through lack of our support, the *Journal* fails and falls with them. Such a happening is inconceivable, and Canadian medicine without the *Journal of the Canadian Medical Association* is something not to be even visualized.

The profession in Ontario is asked to give every consideration to this matter of a bond issue. Back of it is only one thought, the serving of the profession in every way. It should be possible in many cases for several members to unite in buying one bond, kept in trust, perhaps, by some one of them to whom the drawing of the five per cent. interest is not so important as is the putting of Canadian medicine well to the forefront; it is probable also that many of our successful practitioners will besiege the Secretary with orders for more than one bond, feeling that thereby they are using their privilege, as successful men in life, of helping on a common cause. We know the appeal will not be made in vain, and we feel sure that Ontario, the backbone and main support of all measures for the public good, will see to it that she takes her share in this plan of pushing forward to support the medical journalism necessary for the progress of medicine in this part of the world O. E. B.

SPECIAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION

The semi-annual meeting of the Ontario Medical Association was held at the Academy of Medicine, Toronto, on Wednesday and Thursday, December 7 and 8, 1921. On Wednesday afternoon, between fifty and sixty members of the Committee on General Purposes assembled to receive and deal with the reports of the Directors and the various committees. The action taken by the Committee on General Purposes was confirmed by a general meeting of the Association on Thursday afternoon. Some of the important points may be summarized as follows:

Re income tax.—The Directors were urged to make further representations to the Department of Finance requesting that exemptions should include medical society fees, the cost of magazines and periodicals, a greater allowance for the depreciation on books, and the expenses entailed in taking a holiday or in attending post-graduate courses.

Re the Workmen's Compensation Board.—A special committee was to be appointed by the Directors to act with the Workmen's Compensation Board to deal with matters of interest which arise from time to time between the Board and the profession.

Re the Joint Advisory Committee.—This committee, which is representative of the College of Physicians and Surgeons and the Ontario Medical Association, was instructed to submit its findings to the profession at the earliest possible moment with a view to obtaining an expression of opinion from the profession with reference to medical legislation in this province.

Re the Ontario Temperance Act.—Upon assurances having been received from the Board of License Commissioners that they would welcome the assistance of the Ontario Medical Association in dealing with certain technical breaches of the Act, a committee of three was appointed by the Association to confer with the License Commissioners on all such questions.

Re the Increase in Fee.—The Association unanimously resolved to increase the annual membership fee to $10, this fee to become effective January 1, 1922. In connection with this matter, it was brought to the attention of the Association that practically all of the other provincial associations collected not only a $10 provincial fee, but in addition were arranging to collect the $10 annual fee from their members for the Canadian Medical Association.

A great deal of routine business was dealt with, the whole meeting manifestly demonstrating the advisability of holding a mid-year business session which should greatly reduce the time necessary for the transaction of business at the regular annual meeting, which is to be held in Toronto on May 30, 31, June 1 and 2, 1922.

A GENERAL session of the Academy of Medicine of Western Ontario was held on Monday, November 28th, at 2 p.m., in the auditorium of the Medical School, whereat papers were read by Dr. Joseph C. Bloodgood, B.Sc., M.D., of Baltimore, and Dr. Edward W. Archibald, A.B., M.D., C.M., of Montreal.

THE following meetings yet remain to be held in the schedule of meetings for the season of 1921-22 of the Kingston and Frontenac Medical Society: Monday, January 9, 1922—Dr. F. J. Farley, President of Ontario Medical Association; Monday, February 13th—Dr. W. R. Jaffrey, Hamilton, "Blood Transfusion"; Monday, March 13th—Clinical evening, Sydenham Hospital; Monday, April 10th—Clinical evening, Rockwood Hospital; Monday, May 8th—Annual meeting.

THE unveiling of the foundation stone of the Sick Children's War Memorial Hospital, London, Ontario, occurred on November 4th. The dedicatory ceremonies were in charge of the Imperial Order of the Daughters of the Empire Hospital Committee. His Honour, the Lieutenant-Governor of Ontario, Mr. H. Cockshutt, in dedicating the hospital, paid a very high tribute to the unselfish work and sacrifice of the women of London in contributing such a magnificent building. It is estimated that the total cost will be about $350,000.

THE regular monthly meeting of the Middlesex Medical Association was held November 30th in the Tecumseh House. Dr. George Strathy, of Toronto University, gave an interesting paper on the differential diagnosis of pains in the back. Dr. W. Doan, of Harrietsville, gave a paper on the treatment of goitre. These papers were discussed at length by the members. The officers of the organization are: Dr A. F. Thompson, president; Dr. George Racey, Parkhill, first vice-president; Dr. W. Dewar, second vice-president; and Dr. W. H. Woods, secretary and treasurer. The next meeting of the association will be held some time in January.

THE Western Ontario Academy of Medicine held a session on November 4th, at which Dr. L. Barker of Johns Hopkins conducted a medical clinic on nephritis syphilis, epilepsy and encephalitis. He also spoke on the subject of endocrine influence. A special session of the Academy was held on the afternoon of November 8th, in the auditorium of the Medical School, to greet a distinguished visitor, Sir William Taylor, K.B., F.R.C.S.I., of Dublin, who in a very pointed address gave a comprehensive outline of acute intestinal obstruction, with particular reference to the type of intussusception occurring in children. Chronic obstruction and appendicitis were touched upon in his reply to the discussion of his paper

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IN order to meet the needs of those who desire short courses of instruction in radiology, the Faculty of Medicine of the University of Toronto have arranged to provide three courses a year of one month each at the Toronto General Hospital. Classes will be limited and an intensive schedule has been outlined to include:—(a) radiographic technique; (b) interpretation; (c) gastro-intestinal examination. In these courses the entire resources of this large clinic will be placed at the disposal of the student in the most practical manner possible. The tentative dates are as follows:—first course, February 15th to March 15th, 1922; second course, month of October, 1922; third course, month of January, 1923. For full information and terms apply to the Secretary, Faculty of Medicine, University of Toronto.

DISTRICT No. 5 medical meeting, comprising the counties of Peel, York, Ontario and Simcoe, and presided over by Dr. George S. Young, of Toronto, held its meeting for this year on the dates of December 7th and 8th, concurrently with the special business meeting of the Ontario Medical Association. Wednesday and Thursday mornings and Wednesday afternoon were spent by the practitioners in the various public hospitals in Toronto, attending clinics, ward rounds, demonstrations and operations. The Thursday afternoon programme was presented by Professor J. J. McLeod of the University of Toronto, who spoke on "Animal Experimentation," and Professor L. J. Austin of Queen's University, who chose as his subject "Gall Stones and Gall Bladder Infections." Both addresses were interesting and instructive. The outstanding feature of the meeting was the splendid discussion which followed the reading of the papers. The attendance was fair, and many of those who were present expressed their hearty appreciation of the programme.

THE district medical meeting of Counsellor District No. 3 of the Ontario Medical Association, comprising the counties of Bruce, Grey and Dufferin, was held under the auspices of the Grey County Medical Society in Owen Sound on Wednesday, October 26, 1921, with about fifty practitioners in the district present. The sessions were presided over by Dr. George S. Burt, Owen Sound, Counsellor for the district. The afternoon programme was presented by Dr. W. E. Gallie, of Toronto, who took up the subject of "Fractures," and by Dr. F. W. Marlow of Toronto, who spoke on "The Considerations of Some Gynæcological Conditions." Dinner was served in the Y.M.C.A., immediately following which a short address was given by Dr. F. J. Farley, of Trenton, President of the Ontario Medical Association, on the subject of "The Needs for Closer Co-operation and Better Organization of the Medical Profession." The evening session was devoted to the subject of "Infant Feeding," the paper being presented by Dr. Alan Brown of Toronto. Both sessions were characterized by keen discussion, which with the excellent presentations, made the meeting very successful.

THE Faculty of Medicine, University of Toronto, has instituted a graduate course leading to a diploma in radiology. Candidates for the diploma must (a) be graduates in medicine of this university or some other university recognized for this purpose by the senate; (b) have spent at least one year after graduation as an interne in a recognized hospital. The curriculum leading to the diploma extends over one winter session of eight months. The session will be devoted to courses in (a) physics, (three hours daily); (b) radiology: 1—technique; 2 anatomy; 3—pathology; 4—diagnosis; 5—radio-therapy. Examinations on the subjects of the curriculum will be held at the end of the session. Candidates who have passed the examinations and who present certificates of having satisfactorily completed the work specified will be granted the diploma in radiology.

THE full course of post-graduate lectures for the session of 1921-22 given by Queen's University Faculty of Medicine is as follows :October 28—Dr. John Tait, professor of Physiology, McGill University, "Cerebral Localization."; November 10—Dr. William Boyd, Professor of Pathology, University of Manitoba, "Encephalitis Lethargica"; November 25—Professor G. Spencer Melvin, "The Mechanism of the Heart Beat"; December 9th—Dr. J. C. Connell, "Equilibrium and the Semicircular Canals"; January 13th—Professor Reed, "Food Poisoning; Organisms"; January 27th—Dr. Austin, "Genito-Urinary Tuberculosis"; February 10th—Dr. W. T. Connell, "Basal Metabolism"; February 24th—Dr. Mylks, "Pelvic Infections"; March 10th—Dr. Bogart, "The Surgical Treatment of Thyroid Disease"; March 24th—Dr. Gibson—"Heart Arrythmias"; April 14th—Dr. Williamson, "The Toxæmias of Pregnancy."; April 21st—Professor Miller and Dr. Matheson, demonstration of preparations and specimens, with projection apparatus. The lectures will take place in the new medical building at 5 p.m.

THE district medical meeting of Counsellor District No. 1 of the Ontario Medical Association, comprising the counties of Essex, Kent, Elgin, Lambton and Middlesex, was held in Windsor on Wednesday, November 2, 1921, under the auspices of the Essex County Medical Society, whose President, Dr. W. A. MacDonald of Windsor, after welcoming the assembly handed the meeting over to Dr. R. C. R. McDonald of Sarnia, Counsellor of the district. The afternoon programme was as follows: "Some Types of Heart Disease," Dr. William Goldie, Toronto; "Functional Nephritic Tests," Dr. S. M. Asselstine, Windsor; "The Diagnosis and Treatment of Some Gynæcological Conditions," Dr F. W. Marlow, Toronto. At 6.30 p.m. dinner was served, and was immediately followed by short addresses from Dr. F. J. Farley, of Trenton, and Dr. T. C. Routley, of Toronto, President and Secretary respectively of the Ontario Medical Association. The evening programme "Operative Treatment of Fractures End Results as Contrasted With Those of Other Means" (with lantern slides) was presented by Dr. E. R. Secord, of Brantford From the interest manifested throughout the proceedings, and the large attendance, it was evident that the meeting was appreciated by the medical profession of the district

AN item of interest to many members of the medical profession is the recent announcement by the University of Toronto of a series of five lectures on heredity and genetics to be delivered in January by Professor William Bateson, Director of the John Innes Institution, Merton, Surrey. The lectures will be from 5 to 6 p.m., on January 3rd, 5th, 6th, 9th and 10th in the north lecture room of the medical building. Professor Bateson is one of the foremost living biologists and the chief pioneer worker of the modern field of genetics, a branch of investigation which owes its development largely to the discovery of the so-called Mendelian factors as regards the transmission of characteristics from one generation to the next. It was Professor Bateson who, in 1901, first brought to the notice of the English-speaking world the work of Gregor Mendel, forgotten for over thirty years. Since then the field of genetics has had a tremendous growth, and its effects have been felt in a variety of other fields, including not only plant and animal breeding but also medicine and sociology, the latter especially because of the explanation afforded of the inheritance of normal and abnormal physical and mental states and their individual or racial consequences.

THE district medical meeting of Counsellor District No. 4 of the Ontario Medical Association, comprising the counties of Haldimand, Lincoln, Welland, Wentworth and Halton, was held at the Royal Connaught Hotel, Hamilton, on Saturday, October 29, 1921, under the auspices of the Hamilton Medical Society. The meeting was presided over by Dr. F. W. Ernest Wilson, of Niagara Falls, Counsellor of the district. The afternoon programme was as follows: "Blood Transfusion" (technique), with lantern slides, Dr. W. R. Jaffrey, Hamilton; "The Acute Abdomen," Dr. J. K. McGregor, Hamilton; "The Barium Meal and Its Value in Surgical Diagnosis," (with lantern slides) Dr. W. J. Macdonald, St. Catharines; "Common Mistakes in Diagnosis," Dr. Ingersoll Olmsted, Hamilton; "Public Health Topics," Dr. D. A. McClenahan, Hamilton; "A Suggestion Regarding Treatment of Difficult Forearm Fractures," Dr. W. K. Colbeck, Welland; "The Tonsils," Dr. J. P. Morton, Hamilton; "Notes on Pre-natal Treatment," Dr. J. Sheehan, St. Catharines; "Cerebro-Spinal Lues," Dr. J. B. Bauer, Hamilton; "Public Health Laboratory Explanations," Dr. W. Deadman, Hamilton; "X-ray Exhibits," Dr. L. R. Hess, Hamilton; "Notes on Fractures," Drs. F. W. E. Wilson and C. P. Fenwick, Niagara Falls. An informal dinner was served in the banquet hall of the hotel at 7.00 p.m., to which the ladies were invited. Following dinner, Dr. Boothby, chief in metabolism, Mayo clinic, Rochester, Minn., gave a very interesting address, and was followed by Dr. T. C. Routley, of Toronto, who outlined the work of the Ontario Medical Association, urging upon all present the need for continued co-operation and support. From point of view of the programme supplied, the discussion, and attendance, the meeting was a marked success

NOVA SCOTIA

ONE more unit has been added to the hospital area growing up in the vicinity of the Medical School of Dalhousie University in Halifax. The new tuberculosis hospital recently opened shows Halifax taking one more very important step along the lines of public health and preventive medicine. The splendidly appointed tuberculosis hospital will house from fifty to sixty-five persons in advanced stages of tuberculosis The far-reaching effect of proper housing of persons in the terminal stage of this disease at the stage when they are the greatest menace in the home, has an almost incalculable advantage to the public What is equally important to the public, and what must be consoling to the relatives and friends of the tuberculous sick who need hospital care, is to be advised of the recent reciprocal action of the charities committee of the City Council and the medical faculty of Dalhousie University.

It will be recalled that some weeks ago the University offered to nominate an expert consulting and attending medical staff for the new tuberculosis hospital, who will give their services free to the city, and asked at the same time that students in the medical course be given opportunity to study tuberculosis at this hospital. The city officials saw that not only would this opportunity for study be of great advantage to the future doctors of Halifax and vicinity, and would insure the highest type of service free, but would also be of great assistance to future doctors of medicine throughout the maritime provinces, and they acquiesced in the request.

Announcement has just been made by Alderman H.S. Colwell of the appointment of the medical director, consulting and attending staff selected under this reciprocal programme. They are as follows: medical director, Dr. W. Bruce Almon; consulting surgeons, Drs. E. V. Hogan and H. K. MacDonald; consulting internist, Dr. Kenneth A. MacKenzie; consulting laryngologist, Dr. R. Evatt Mathers; consulting pathologist, Dr A. G. Nicholls; consulting obstetrician, Dr. W. B. Almon; consulting urologist, Dr. Frank Mack; consulting pædiatrist, Dr. M. J. Carney. Attending staff of tuberculosis specialists, Dr. T. M. Sieniewicz,assisted by Drs. M. J. Carney and H. G Grant. Attending dentist, Dr. G. N. Stults; pathologist, Dr. D. J MacKenzie, and resident interne, senior student, Mrs. Corey S. Bezanson.

With a staff of such specialists in charge of the tuberculous sick, the public may be assured that nothing will be left undone that might offer a cure or relief for those admitted for treatment. Those who deliberately enter the hospital in order to protect their loved ones at home may be assured of the best of care and of every comfort that a modern hospital can provide, easy of access to friends and relatives.

When the University Health Centre to be erected out of Rockefeller funds is erected and staffed, the city of Halifax will have the most complete tuberculosis and best co-ordinated programme of any Canadian city, and the medical school will have facilities for teaching medicine second to no school on the American continent.

QUEBEC

The Province of Quebec Medical Association held its inaugural meeting on December 5th, in Montreal. The prospective constitution and by-laws were read and discussed, and temporary officials were nominated. The permanent appointments will be made at the first annual meeting, which should occur in the very near future. Dr. Grondin of Quebec was nominated as President, Dr. W. G. Reilly of Montreal as first vice-president, and Dr. Harwood second vice-president. Drs. Rheaume and K. Cameron were appointed joint secretaries, and as additional members of the executive committee Drs. D'Agnean and C. F. Martin were selected to co-operate in the organization of the association. In all probability the first meeting will be held in Montreal, and the programme will consist of clinical demonstrations in the various English and French hospitals during the two days of the session. It was considered wise that an effort should be made to give demonstrations, rather than papers, in order to obviate difficulties which might arise from the bi-lingual character of the meeting.

ALBERTA

Dr. Whitelaw of Edmonton, the Chairman of the Provincial Medical Board of Alberta, was operated upon recently for appendicitis. His many friends will be glad to learn that he has made a good recovery

MANITOBA

The following resolutions were passed at the recent annual meeting of the Manitoba Medical Association:*

1.—*Be it resolved:*—*Whereas* it has been deemed advisable in the interests of national medical progress that the Canadian Medical Association have placed at its disposal increased funds for its activities, that this Association approves of the annual fee of the Canadian Medical Association being increased to $10.00 as from January 1, 1922.

2.—*Whereas*, there is not in the Dominion of Canada any means provided for the official inspection of drugs on sale throughout Canada or of clinical thermometers, and *whereas*, there is inspection of drugs and of thermometers in other countries, while there is no inspection in Canada is likely to make of Canada a dumping ground for inferior preparations and defective instruments; *resolved*, that the Manitoba Medical Association urge upon the Canadian Medical Association the creation of a Bureau of standards and the enactment of stringent regulations.

3.—*Resolved that:*—We memorialize the Canadian Medical Association to make representations to the Dominion Government that in the manufacture or importation of salvarsan products no monopoly or discrimination be tolerated, having due regard only to the therapeutic value of all such derivatives which are on the market.

4.—*Resolved that:*—This meeting of the Manitoba Medical Association instruct the executive committee for the new year, to co-operate fully with the president of the Canadian Medical Association and with the Winnipeg Medical Society, in promoting the success of the Canadian Medical Associaion, meeting at Winnipeg in 1922.

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*The above resolutions, in so far as they affect the Canadian Medical Association, will be brought to the attention of the Association at its annual meeting in Winnipeg.

5.—*Whereas,* at the Halifax meeting of the Canadian Medical Association a committee was appointed to collect data with regard to the practice of fee-splitting, and to endeavour to find a solution for the difficulties associated therewith; and *whereas,* it was requested that each provincial association appoint a committee to co-operate with that of the Canadian Medical Association: *resolved,* that such a committee of the Manitoba Medical Association be appointed.

BRITISH COLUMBIA

There has just been completed on the grounds of Shaughnessy Hospital, which is operated and owned by the Department of Soldiers' Civil Re-Establishment of Canada, a pavilion for the accommodation and treatment of cases of tuberculosis which may either be awaiting transfer to a sanatorium, or cases which may be deemed unsuitable for sanatorium treatment. The general plan of the pavilion is excellent, containing two wings connected by a central administrative section. One wing contains six private and two semi-private wards. The other wing is a general or open ward containing 15 beds. The building faces south and a large twelve-foot verandah, or sleeping porch, covered with an awning which can be rolled up on dark days, extends the full length of the west and south sides. The building is heated by hot water with a separate heating plant and is of stucco finish and extremely pretty, and was erected at the cost of $12,400. This amount was provided from the remainder of the regimental fund of No. 5 Canadian General Hospital, which, as will be remembered, went overseas from this province, and which has been held by the trustees of this fund ever since. It is difficult to imagine how this money could have been better expended. This building will also be the headquarters of a clinic for diseases of the chest, for ex-soldiers desiring treatment or re-examination, and will in fact provide for ex-soldiers special chest examining facilities in the same manner that the Rotary Clinic does for civilians in the city of Vancouver.

Drs. McEachern and Vrooman of Vancouver made an appeal to the Rotarians for $2500 for the tubercular relief committee of that club. Dr. M. T. McEachern also addressed the Kiwanis Club of New Westminster on cancer, and sketched the efforts of the American Society for the Control of Cancer in aiding scientific research and furthering the education of the public.

Mr. Albert Carless of King's College Hospital, London, was the guest of honour at a dinner held in the University Club and tendered by the Vancouver Medical Association. Mr. Carless is in Canada in the interests of the work of the Barnardo Homes. He at one time was one of Lister's house surgeons and later his assistant. He recalled Lister's personality and spoke on the surgery of those "ancient" days. At the dinner there were present sixty of the profession of Vancouver, as well as several guests who were in the city for a meeting of the Pacific North-west Surgical Association.

At the regular meeting of the Vancouver Medical Association in November there was a symposium on Tuberculosis. Dr. G. B. Murphy discussed the question of bovine tuberculosis and public health, Dr. A. J. Damman the transmissability of the bovine type of bacillus from the standpoint of a veterinary surgeon, and Dr J. Ellis Griffiths some problems in the bio-chemistry of tuberculosis. A clinical meeting of the Association was also held, at St. Paul's Hospital, where many interesting cases were exhibited.

Dr. Alexander Lapp has been appointed to the position of Medical Superintendent of Tranquille Sanitorium, British Columbia. Dr. Lapp saw service in the war and for the past three years has been assistant superintendent at Ste. Agathe des Monts' Sanitorium. He had previously served on the staff of the Gravenhurst Sanitorium in the Muskoka district. Dr. James Kenny, who has been assistant superintendent at Tranquille, will leave to take up post-graduate work.

GENERAL

The Report of the Proceedings of the Second English-Speaking Conference on Infant Welfare, held at Central Hall, Westminster, on July 5th, 6th and 7th, 1921, has been published and may be ordered from the National League for Health, Maternity and Child Welfare, at 117 Piccadilly, London, W. 1, for the sum of 2s. 6d. postpaid. Twelve or more copies may be ordered at the reduced rate of 1s 9d per copy The chief subjects dealt with are as follows: milk; maternity homes; residential provision for mothers and babies (especially unmarried mothers with babies), inheritance and environment, the ante natal factors of life and death; welfare centres; the syphilitic mother and her infant, the psychology of the mother and her child; the vital and essential forms of child welfare work. Everyone interested in child welfare will find this a valuable handbook on the above subjects. The addresses are, as might be expected, up-to-date, interesting, and full of instruction.

The twenty first annual report of the Canadian Association for the Prevention of Tuberculosis, a volume of 150 pages crammed with interest, is about to come off the press and be distributed, in English and French, to over 7,000 recipients, before Christmas. This is obtainable upon request from the secretary, Bank St. Chambers,

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Ottawa. There is no charge. A synopsized directory compiled by the same office, and printed for it by the courtesy of the Department of Dr. Amyot, Federal Deputy Minister of Health, is being enclosed along with the annual report. It contains details of the agencies tabulated below, and is obtainable for the asking.

CANADIAN AGENCIES AVAILABLE FOR THE DIAGNOSIS AND THE TREATMENT OF TUBERCULOSIS

	Alberta	British Columbia	Manitoba	New Brunswick	Nova Scotia	Ontario	Prince Edward Island	Quebec	Saskatchewan
Sanatoria (beds	2 201	2 221	2 390	2 175	3 360	12 1792	1 75	8 563	1 280
Hospital beds for tuberculous	*	*	*	‡	‡	†	‡	1	*
Chest Clinics	2	2	3	3	14	13	1	6	2
Observation beds, Chest Clinics (centres)	1	3	3	1	1	9	0	0	2
Open Air and Nutritional Classes in Schools	1	2	3	0	2	11	0	1	0
Public Health Nurses doing work for Tuberculous (centres)	2	3	58	8	12	50	1	5	11
Diagnostic Laboratories	3	2	5	3	2	25	2	11	2
Day Camps	2	2	0	0	1	0	0	0	0
Preventoria	0	0	1	0	0	3	0	0	1

* All hospitals approved by their Provincial Governments
† 10% of beds of all hospitals approved by their Provincial Governments
‡ No provision for the Tuberculosis stated

Obituary

ROBERT CHILDS PATERSON

Dr. Robert Childs Paterson of Saranac Lake died suddenly under tragic circumstances on December 24, 1921, aged 43 years.

After a brilliant school career, he graduated from the Faculty of Arts, McGill University, as gold medallist, and with first-class honours. He then entered the Faculty of Medicine, and on graduation won the Holmes gold medal. After spending two years in the Montreal General Hospital, during the latter portion of which he acted as Medical superintendent, Dr. Paterson went to Europe, 1904-06, and studied in London, Freiberg, Berlin and Berne. Unfortunately, shortly after his return to Montreal he developed pulmonary tuberculosis, and was compelled to take a prolonged cure. Instead of being disheartened at this break in his career, after regaining his health, he devoted himself to the study of pulmonary tuberculosis in such a keen and thorough manner that he rapidly became an authority in this special branch, and a friend and comfort to those who came under his care. His opinions and written contributions all show depth of thought and breadth of judgment.

On learning of his death, Saranac Lake and vicinity suspended the Christmas celebrations in respect to this beloved physician. A staunch friend, devoted husband and father, by his death the Canadian profession also loses an eminent representative.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

Collected Papers of the Mayo Clinic, Rochester, Minn. Octavo of 1392 pages, 446 illustrations. Philadelphia and London: W. B. Saunders Company. Cloth, $12.00 net. (By Mrs. M. H. Mellish) 1921.

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PRINCIPLES OF MEDICAL TREATMENT. Offering clearly and concisely sound principles of medical treatment based on known pathology. By GEORGE CHEEVER SHATTUCK, M.D., A.M. (Fifth revised edition). Octavo, 309 pages, $3.50. Publishers: W. M Leonard, Boston, 1921.

THE BLOOD SUPPLY TO THE HEART. Offers a complete description of the arterial and venous blood supply to the normal heart; blood supply to the neuromuscular system of His and its pathological and clinical significance, together with a newer view in the discussion of the anatomical factors concerning the etiology and development of valvular endocarditis, and of the physiological course and character of the cardiac circulation in the various age periods. By LOUIS GROSS, M.D., C.M., Douglas Fellow in Pathology, McGill University, and Research Associate, Royal Victoria Hospital, Montreal. Publishers: Paul B. Hoeber, New York. 171 pages. Price $5.00. 1921.

DISEASES OF THE DIGESTIVE ORGANS. (Third edition). Having special reference to the diagnosis and treatment of diseases of the digestive organs. By CHARLES D. Aaron, Sc.D., M.D., F.A.C.P. 904 pages, illustrated with 164 drawings, 48 roentgenograms and 13 coloured plates. Publishers: Lea & Febiger, Philadelphia and New York. 1921.

HISTORY OF MEDICINE. Third edition, with Medical chronology suggestions for study, and bibliographic data. By LIEUT.-COL. FIELDING H. GARRISON, A.B., M.D., 942 pages. Publishers: W. B. Saunders Co., Philadelphia and London, 1921.

CLINICAL DIAGNOSIS. By C. P. EMERSON, A.B. 726 pages, with 156 illustrations. Fifth edition. Price $7.50. Publishers: J B. Lippincott Company, Philadelphia and London Also at 201 Unity Bldg., Montreal 1921.

THE SPLEEN AND SOME OF ITS DISEASES. Based on, and containing the material of the Bradshaw Lecture delivered at the Royal College of Surgeons of England in December, 1920. By SIR BERKELEY MOYNIHAN, Leeds. Publishers: W. B. Saunders Co., Philadelphia. 129 pages. 1921 .

DISEASES OF THE SKIN. Ninth edition. Complete treatise on diseases of the skin for advanced students and practitioners. By HENRY W. STELWAGON, M.D., Ph.D., with the assistance of HENRY K. GASKILL, M.D., attending Dermatologist to the Philadelphia General Hospital. 1313 pages, with 401 text illustrations and half-tone plates. Publishers: W. B. Saunders Company, 1921. Cloth, $11.00 net. Canadian agents: The J. F. Hartz co., Limited, Toronto, Ont.

X-RAYS AND RADIUM IN THE TREATMENT OF DISEASES OF THE SKIN. Correlating fully the specialized training of the dermatologist and roentgenologist, including the essential elements of physics and biology. By GEORGE MILLER MACKEE, M.D. 602 pages and illustrated with 250 engravings and 22 charts. Publishers: Lea & Febiger, Philadelphia and New York, 1921.

SURGICAL ANATOMY. By WILLIAM FRANCIS CAMPBELL, A.B., M.D., F.A.C.S. 681 pages, with 325 original illustrations. Third edition. Publishers: W. B Saunders Co., Philadelphia and London, 1921. Cloth, $6.50 net.

THE PSYCHOLOGY OF MEDICINE. Presenting concisely, but very clearly, the important contributions to psychology resulting from the practice of psychotherapeutics. By T. W. MITCHELL, M.D. Publishers: Methuen & Co., Ltd., London, Eng. 187 pages. Price 6s. net.

THE WINNIPEG MEETING

The annual meeting of the Canadian Medical Association will be held in Winnipeg June 20th to 23rd inclusive, 1922. The present time is none too early to be thinking about your hotel reservations. The Committee on Hotels and Information are very anxious that medical men intending to come to Winnipeg should write early regarding hotel accommodation. The Chairman, Dr. Gordon S. Fahrni, 507 Boyd Building, Winnipeg, will be glad to receive inquiries.

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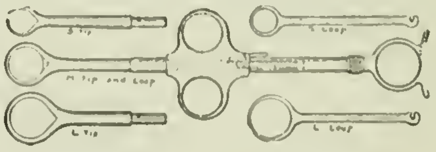

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THE OUTLOOK IN SURGERY*

George E. Armstrong, C.M.G., M.D., LL D (Queens), D.Sc. (Liverpool). F.A.C S.

SURGERY has advanced through the ages step by step, as new discoveries were made in the ancillary sciences. A little, only a little delving into Carlisle's "dry as dust" literature will show that centuries ago there were able and competent surgeons, and that the present standard of surgery has been gradually developed, often under difficult conditions, but always with an advance In the age of Pericles there were treatises on fractures and dislocations that are hardly surpassed in some ways in the present mechanical age. Modern surgery stands on four great foundation stones. The first is anatomy. This corner stone was laid by an enthusiastic study of anatomy in the school of Alexandria about 300 B.C. Then came Ambroise Pare, 1510-1590, with his discovery of the ligature. After him came Morton (1846) with the discovery of ether and anæsthesia, and finally Lister and anti-septic surgery.

I have no hesitation in saying that since the birth of our Saviour no man born of woman has contributed as much to human welfare as Lister. Think of him as a surgeon if you will, but think, let your wildest imagination try to picture the result of the application of his principles to surgery, to research, to medicine and the ancillary sciences, and you will yet fall short of the reality.

Up to the present time surgery has dealt largely with emergencies and pathological conditions. This is no reflection on its value to humanity. It has saved life, restored function and so contributed to the sum total of human happiness, and yet to a great extent it has been more or less mutilating in its methods. So long as man continues to live under present conditions this sort of surgery is bound, of necessity, to obtain. On the other hand, we are well started on what may be defined as physiological and constructive surgery. Chemistry, physiology, anatomy, embryology and physics must each contribute their quota.

The great advances in abdominal surgery during the past fifty years illustrate this point. The relief of a mechanical obstruction, whether due to a strangulated hernia, a malignant growth in the gut or a pyloric stenosis, was obviously a work of necessity, but the cause of death in intestinal obstruction was correctly understood only as a result of the work done experimentally and explained by the chemist and toxicologist. The chemistry of digestion illuminated the whole subject of nutrition, and demonstrated the part played by the different organs concerned. Embryology threw light on the function of the fore, mid and hind gut. The investigations of Sir Arthur Keith have again given to us a new viewpoint by indicating the part played by the nervous system. We are now beginning to have a sound scientific understanding of the part played by the abdominal organs in the digestion and assimilation of food and the excretion of the by-products. Much remains to be done but we have a good start. We have acquired knowledge, but what is of even more importance, we have developed methods of investigation that give promise of greater things to come.

What has been accomplished in the case of the thyroid is evidence of what may be expected to follow. The earlier operations were undertaken for the removal of large unsightly tumours, of malignant growths, and for relief of pressure symptoms. As our knowledge increased it was recognized that a different group of symptoms resulted from an increased or altered secretion of the thyroid and the operation of removal of a portion of the gland to lessen the total output was developed to its present standard. Gradually we came to recognize the changes that take place as a result of too much or too little secretion in the young growing child and in those of mature age. The close association between the thyroid gland, the reproductive organs and the sympathetic is now a matter of common observation. The thyroid tends to enlarge at puberty, marriage and during pregnancy. Amenorrhœa is common even in the minor forms of hypothroidism, while myxœdema may occur after the climacteric. Graves' disease was observed in epidemic form after the San Francisco earthquake and during the period of air raids in London, and its etiological relationship to the sympathetic nervous system was demonstrated by Cushing, who found that the symptoms of Graves' disease developed in a cat after he sutured the phrenic nerve to the sympathetic so that every respiration stimulated the latter. It is said that if a distressing emotion has a matrimonial origin, Graves' disease is particularly likely to follow, as each limb of the basic tripod is involved. At last we have the active principle of thyroid secretion in crystalline form, and it remains to be seen how its administration may improve the cretins and myxœdematous patients. Our latest discovery is the relation of thyroid secretion to the production of energy and heat, in other words to metabolism. It would seem as if every cell in the body was dependent upon thyroid secretion.

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*Abstract of a lecture to the McGill Undergraduate Society.

The study of the thyroid led to the investigation of the functions of all the ductless glands, and now is opened up a whole new field, endocrinology.

The adrenals are of double origin, the medulla and outgrowth of the sympathetic, the cortex from the Wolffian body which also supplies the interstitial cell of the reproductive glands. We have an example of adrenal deficiency in Addison's disease, and very soon we may expect to learn about its influence on blood pressure, sexual development, and sugar tolerance.

The pituitary gland is of dual origin, like the adrenal. The anterior glandular part growing up from the epithelium of the buccal cavity, the intermediate and posterior parts being an outgrowth from the central nervous system. The influence of hypopituatarism and hyperpituatarism on the pre-adolescent and a post-adolescent is now fairly well established. Clinicians are learning to recognize the minor degrees of hypopituatarism in the smooth skin, the obesity and the increase or lessening of sugar tolerance, with amenorrhœa or impotence.

That the reproductive glands form an important internal secretion useful particularly in developing secondary sexual characteristics is demonstrated by the quite different effect produced by tying the whole spermatic cord as compared with ligature of the vas deferens.

By way of contrast I would call attention to another group of endocrine glands associated with the vagus and concerned rather in the production and storage of energy than in the expenditure. I refer to the parathyroids and the endocrine glands of the stomach, the duodenum, and the pancreas. You know that a condition of nervous excitability often culminating in tetany follows injury or removal of the parathyroids, and that in doing a thyroidectomy the surgeon is careful not to remove the parathyroids or to interfere with their blood supply. Calcium has a sedative action on nerve cells. MacCallum has shown that parathyroids in some way control the distribution of calcium in the body. This knowledge of the action of parathyroids may probably be added to, but so far as I know the above statement fairly well expresses our present views.

The pyloric glands secrete a hormone that stimulates the vagus and the glands of the fundus of the stomach. The acid gastric juice passes into the duodenum and there stimulates the mucous membrane to form secretin, which in turn stimulates the secretion of the pancreas. There is also an internal secretion of the pancreas that promotes the assimilation of sugar. These endocrine glands as defined by Cannon assumes the task of building up reserves against a time of strain and stress.

We have then two main groups of endocrine glands The one including the adrenals with other chromaffin cells, the thyroid, the pituitary and the interstitial cells of the reproductive glands. They are associated with the sympathetic. They are accelerators and display kinetic energy. The other group including the parathyroids and the endocrine glands of the stomach, duodenum and pancreas, are associated in action with the parasympathetic. They are retarders and store potential energy.

In this connection allow me to quote a paragraph from a recent address by Langdon Brown. "To get a general conception of the principle of internal secretion it is necessary to start from the premise that the development of each individual recapitulates, briefly and with modification, the history of the race And it is helpful to remember that while life has been present on the earth for millions of years, man did not appear more than a comparatively few thousand years ago. Every time an individual repeats the history of the race he does it the more easily as the result of practice. Thus it happens that the fœtus in nine short months of pre-natal life recapitulates the history of millions of years, while his longer infantile life only repeats the history of a few thousand years. That even an adult may speedily revert to the instincts and habits of a cave man, the war has abundantly shown. Later veneers of civilization are easily cast aside."

The harmonious functioning of the ductless glands, upon which we are dependent for normal growth, development and well-being, are seen to be closely related to two sets of nerves, the sympathetic and the parasympathetic, and above all the brain and central nervous system. Crile and other research workers have demonstrated that fatigue is essentially brain tire. A muscle might continue in action indefinitely if supplied continuously with nervous energy. As stated by Sherrington, the brain is the master tissue of the body. The brain is fatigued by work, excitement, worry, fear, etc. The brain requires rest at regular intervals. We should give our brain at least one-third of the twenty-four hours free from labour. It only rests properly during what we know as sleep.

What is the mechanism of brain tire? Crile asks the question and suggests that possibly the primary source of brain exhaustion is to be found in the liver. In support of this idea he says: "The brain cells contain almost no stored carbohydrates or neutral fats; they contain almost no factors of safety against acidosis. They have almost no stored oxygen. The brain cells are almost wholly dependent on the blood for oxygen and for carbohydrate fuel to maintain their active and continuous metabolism: The blood is dependent on the liver for sugar for the brain."

"The extreme avidity of the liver cells for acid metabolites, coupled with the immense cellular surface exposed to the blood stream, we conceive to be one of the greatest safeguards to the brain against acidosis. The large storehouse for sugar in the liver serves as the fuel depot for the brain and as a protection against want of anærobic oxygen. The blood stream carries oxygen and sugar to the brain. The vast volume of blood distributed to the liver, the lungs and the kidneys provides for the rapid elimination of waste, which is urgently necessary, especially for the safety of the brain."

You see, gentlemen, we have gained much knowledge of the mechanism of life and the wonder of growth and action, but the nature of life remains a mystery.

Professor Stanly Gardiner says in the section of Zoology of the British Association: "We may not know in our generation, or in many generations, what life is, but we can know enough to control that life." It has been shown that our growth and well-being are dependent on the internal secretions of the ductless glands, but all this does not explain life "which begins and proceeds along definite and unchanging lines before the regulating organs are formed."

The surgeon of the future will more and more, as knowledge increases, direct his labours toward a correcting of fundamental errors or defects, particularly in that great laboratory the abdomen, whence comes our nutrition and also, our infections, at least in great part.

To accomplish this the surgeon must work hand in hand with those engaged in research in the ancillary sciences. The biologist, the embryologist, the physiologist, the chemist, the physicist as well as the pathologist, must be his constant companion, and with their aid he must strive to recognize and to become familiar with the earliest deviations from the normal.

SOME PROBLEMS IN INTRACRANIAL DIAGNOSIS*

A. H. Gordon, M.D.

Assistant Professor in Medicine and Clinical Medicine, McGill University, Montreal

Physician to the Montreal General Hospital

MAY I be permitted a word of explanation in reference to the title I have chosen? It is not posing as a neurological specialist that I have ventured to speak, nor have I fallen upon any new light in these matters, but like many others interested primarily in Internal Medicine, the sundry difficulties in the separation of some affections of the central nervous system from others not primarily located there, as well as the attempts to distinguish between one intracranial lesion and another of a different etiology, have on many occasions brought me face to face with the complexity of the problem, and from this chaos there have emerged a few landmarks, in the form of obstacles to be shunned and of signposts to be heeded, that I have made bold to bring before you.

It is inevitable that in any scheme of teaching from cases, no one case can present all sides of a subject; but from each, I think, one may, if he keeps an open mind, discover at least one aspect, and it is with this idea, and this idea alone, that this group of cases is presented.

There is probably no more common intracranial condition with which the physician has to deal than cerebral vascular disease (thrombosis or hæmorrhage of the ordinary type); and the following record might be duplicated a score of times in any year, in any hospital.

On October 4, 1916, a bookkeeper of 48 years of age was admitted into the M.G.H. with the history that he had been found unconscious at the foot of the stairs of his house at 5 a.m. the previous day. There had been short periods of partial consciousness during that day, but he remained quite unconscious from the time of his admission until his death five days later. There was complete paralysis of his right face, arm and leg. His head was turned to the right, and his right pupil was dilated. Both knee jerks were increased, and there was a Babinski reaction on the right side and the abdominal reflex was absent on the right side also. His pulse ranged from 60 to 90 and his temperature from 100° to 101°. His blood pressure was 100-165. There was no history of syphilis nor alcohol, and his vessels were not specially thickened. He developed a bronchopneumonia and died on the fifth day, and we thought we had done our duty by him until the autopsy disclosed an extra-dural hæmorrhage on the left side without fracture of the skull, which would have been susceptible of relief by operation.

It is true that without a history of primary unconsciousness with recovery, going on to persistent coma, we might make the same mistake again; still it points the warning to take nothing for granted, but to look for all the details of the full clinical picture in heart, vessels, form of paralysis, history, age and lumbar puncture findings, before being satisfied that we have left nothing undone to establish definitely the diagnosis of a true intra-cerebral affection.

Another aspect of the problem as it relates to cerebral hæmorrhage appears in the way in which it is simulated by uræmia.

This patient, a man of 60, was seen with Dr. MacIver, complaining of severe headache and vomiting. He had formerly used alcohol fairly freely but not of late years. He had never had syphilis. For many years he had suffered from severe headaches, and for the past year had nocturnal frequency of urination, some shortness of breath, and swelling of the eyelids in the morning. One year ago he had an attack similar to the present one, but less severe. Of late both vision and memory have been impaired. His mother died of nephritis and one brother now has that disease.

Present illness. On December 28th, while on a street car he had a sudden acute pain in the angle of the left eye, felt weak and dizzy and nauseated. He got off the car and was assisted to his home. He did not stagger, but vomited once before reaching his house. Headache developed and became very severe. The urine was examined;

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*Read at the fifty-second annual meeting of the Canadian Medical Association, Halifax, July 1921 the specific gravity was 1010, and albumin was present. The blood pressure was 170 systolic and 80 diastolic; pulse 110; temperature 99.3°; respirations 30. There was no paralysis, and the reflexes were normal.

He was admitted to the hospital and 350 c.c. of blood was withdrawn from a vein in the arm, and hot packs were given with but slight relief from the headache, of which he complained most bitterly. It was felt in the forehead and at the back of the neck, and was very persistent. He was quite conscious; the face was flushed and the eyelids suffused. There was a marked degree of thickening and tortuosity of the peripheral arteries and the aortic second sound was high-pitched and ringing.

On the following morning the tongue was deviated slightly to the right. There was no other indication of muscular weakness, but a Babinski and an Oppenheim reflex were present on the right side, in addition to a slightly exaggerated knee jerk. The pupils were equal and active, not specially contracted. There was no asynergism. The muscles of the neck were slightly resistent. The ocular fundi showed only arterial thickening. A lumbar puncture withdrew very bloody fluid under slightly increased pressure, and this was followed by considerable relief of the headache. Two days later a severe and persistent pain developed in the lumbar region and in the backs of the legs, and Kernig's sign was present on both sides. Retraction of the neck became more marked and the left pupil became dilated.

Fifteen days after admission he was suddenly seized with excessively severe pain in the left temporal region accompanied by sweating, irregular breathing and irregular pulse, but no loss of consciousness. Within two hours three similar attacks occurred, in the last of which he became unconscious and died in a few minutes.

The clinical diagnosis was cardiorenal disease with cerebellar hæmorrhage and effusion of blood into the spinal canal. The autopsy showed, in addition to the presence of cardiorenal disease, a fresh hæmorrhage into the posterior tip of the right optic thalamus, which had ruptured into the right lateral ventricle and extended into the subdural space to the cauda equina. Besides this fresh hæmorrhage in the optic thalamus, there was evidence that another hæmorrhage had taken place at this site at a comparatively recent date.

The main teaching of this case is the fact that focal signs, be they never so slight (in this case only deviation of the tongue) indicate something more than uræmia; and another point which is here illustrated is that unconsciousness, though a usual, is not an invariable feature in cerebral hæmorrhage. The routine examination of such a case in these days would not be complete without the examination of the blood for urea and its associated products, and no matter how closely the clinical picture simulates an uræmia, we would hesitate before making a diagnosis of uræmia in the absence of urea retention in the blood. As a matter of fact, the more carefully one considers his own and others' mistakes, the more it is realized that the diagnosis of uræmia has in the past been overworked, and that a number of apparent uræmics have owed their symptoms to local intracranial disease.

Another instance in which the diagnosis of a cerebral vascular affection was beset with difficulty was the following:

J. L., 22, employed as a type founder, had been working for a month using melted lead mixture. Suddenly while at work he became unconscious, and remained so for three days; and with unconsciousness there developed paralysis of the right and side with aphasia. He was seen 6 months later the paralysis was still present, and was admitted under the care of Dr. Grant Campbell, to whom I am indebted for the report. All his other systems had been found negative. Wassermann, cerebrospinal fluid, urine and blood showed nothing, and there was no hypertension. Re-examination, however, demonstrated a very abrupt snapping first sound of the heart, and the electrocardiogram showed a definite plateau P. wave with bifurcation From these facts a diagnosis was made of mitral stenosis with cerebral embolism. In this instance both the patient and his friends were convinced that lead poisoning was at the bottom of his ailment, but neither was there a lead line or any change in the red cells to confirm that opinion. The absence of syphilis or of renal disease or of a cardiac murmur left one at a loss for an explanation of vascular cerebral disease in a young man, and the only clue was the abrupt first sound which pointed to a mitral stenosis, and which the cardiographic tracing helped to confirm, thus offering a reason for a cerebral embolism.

The inflammatory diseases within the cranial cavity not only require to be distinguished from febrile affections originating outside the skull, but also, and of equal importance, from one another. And here again one must insist upon the value of regarding the whole clinical picture as opposed to the dependence upon any one special sign.

A young Hebrew of 22, previously healthy, was seen with Dr. Schacher about midnight on February 26, 1920. For about two weeks he had been feeling miserable, with cold in the head, sore throat and nose bleed. He had slight headache and ringing in the ears during the same period. He had vomited once two weeks before, and again the day before, but had kept at his work until two days ago. He had earache on the 24th, but it was better on the 25th, and he went out; but on the 26th he complained of severe headache and pain in the neck and vomiting. He became unconscious about 11 p.m., with incontinence of urine. When seen by Dr. Schacher he was completely unconscious and very restless, moving all of his limbs. The pupils were widely dilated and immobile. T. 102, P. 120, R. 40, B.P. 76-132.

At first there was no retraction of the neck and only a suggestion of a Kernig's sign, the knee jerks were present but there was no Babinski, though this appeared later. The leucocyte count was 26,140. The urine contained both albumen and sugar. The right ear showed a catarrhal otitis media and the left membrane was red, sodden and bulging, and was incised. Lumbar puncture gave a cloudy fluid under pressure showing 24,000 cells per m.m., chiefly polymorphs, and a marked globulin reaction. Gram positive cocci were found in the smear, which on culture proved so be streptococcus mucosus capsulatus. Death occurred 12 hours after admission, and autopsy showed a septic meningitis spreading from the ear.

The problem one was faced with here was then, sudden coma with fever, without, at first, irritative signs in the meninges, in a patient slightly ill for two weeks and with albumen and sugar in the urine. This combination might mean almost anything, but with a high leucocyte count and a purulent spinal fluid the picture is completed, and one need then only ask is there anything which will not fit into such a picture. History, painful ear, slight fever, headache, vomiting, albuminuria, and finally glycosuria, for it is not at all uncommon to find glycosuria in organic intracranial disease. In this instance the diagnosis of a streptococcus meningitis was made and a polyvalent serum given intraspinally, but with no avail.

The next case offered a problem of somewhat similar character, but I regret to say that the various pieces of the puzzle were only placed together at the autopsy table; but since the case illustrates well a recognized connection between pulmonary infection and cerebral abscess I will include the report.

A dairyman of 50, whose sister had died of tuberculosis, had two fairly severe attacks of hæmoptysis 28 and 25 years ago, diagnosed as pulmonary by the late Dr. Palmer Howard. He had no persistent cough, and aside from the hæmorrhages had always been well. A month before admission he had a recurrence of the hæmorrhage and had lost an average of an ounce of blood daily ever since. Five days before admission a headache appeared, getting steadily worse until it became excruciating, preventing sleep and only controlled even for a time by large doses of morphia. On admission he had a pulse of 72 and temperature of 101° and blood pressure 80-120. There was slight retraction of the head and a doubtful Kernig's sign. He was very dull mentally but could be roused, and talked rationally. He was very restless. The knee jerks were exaggerated and a double Babinski was present and the abdominal reflexes were absent. The thoracic organs were negative to examination. Leucocytes were 27,000 per m.m. Lumbar puncture withdrew 20 c.c. of very turbid fluid containing 3600 polymorph cells to the m.m. Smears were absolutely negative for organisms, but he was given anti-meningococcus serum on account of the turbid spinal fluid.

In the following days he developed a left-sided paresis, vomiting and increasing stupor with rising pulse rate and a right external squint, and died 5 days after admission with a diagnosis of tuberculous meningitis and inactive pulmonary tuberculosis. The autopsy showed an old abscess the size of a marble near the hilus of the lung containing a fragment greatly resembling a root of a tooth. The odour from this cavity was inexpressibly foul. There was no sign of tuberculosis. The brain showed several cerebral abscesses of recent origin, one of which had ruptured into the subdural space, causing a spreading meningitis. From none of the material was any organism recovered, but the pus gave the same foul odour as the pulmonary abscess.

The problem here was a meningitis of moderately acute onset in a man with an old history of pulmonary hæmorrhage, in which the cerebrospinal fluid was frankly purulent, but neither on smear nor on culture did it yield any organism. If the case were to occur again, I admit the likelihood of repeating the mistake of diagnosing tuberculous meningitis. There is no doubt but that tuberculous meningitis is occasionally accompanied by a purulent spinal fluid containing a preponderance of polynuclear cells, but in such a case one would expect to find tubercle bacilli in fairly large numbers. In one instance we found them as numerous as in a grossly infected specimen of sputum. It is quite possible, too, that in anærobic cultures the organism responsible for the infection might have been found.

We all recognize that there are states on the border line of meningitis (the so-called meningismus) in which the most careful investigation leaves us in some doubt. Under this heading I think may be placed the nervous phenomena in the following case:

A Hebrew shopkeeper of 58, in this country for many years, was taken ill with a chill and a headache. His breathing became rapid and he entered the hospital with a diagnosis of probable pneumonia, though a rash had been noted on his abdomen just before admission. When seen, he was irrational, with a high temperature, rapid pulse and rapid breathing. He was only partly conscious. Over the skin of the body and arms was an eruption resembling measles, but many of the spots were almost petechial. There was evidence of a moderate broncho-pneumonia. The next day more marked nervous symptoms appeared. Distinct retraction of the neck and an indefinite Kernig's sign appeared and a persistent contraction of the left arm, with in addition a spasm of the whole body resembling that of strychnine poisoning. There was no paralysis and no abnormal reflexes, and the pupils were contracted, equal, and active. He was now quite unconscious, and his general condition very grave. Lumbar puncture withdrew clear fluid with no globulin and 40 cells per m.m. Leucocytes in the blood were 11,000 per m.m. The fever dropped by crisis on the 11th day and immediate improvement commenced.

To those accustomed to typhus fever this man would have presented no problem, but to us, the appearance of a near petechial eruption with fever and meningeal irritation raised at first the suggestion of cerebro-spinal fever, but the clear spinal fluid, the absence of marked leucocytosis, and the clinical course, gave the clue to the diagnosis of sporadic typhus. Curiously enough, no pediculi were found upon his clothing, nor had he upon close questioning been found to be in contact with any recent arrivals from Europe, nor had he handled any clothing from that source.

When we come to the consideration of tumour of the brain, one is struck by the amazing number of variations from the classical picture; and I shall make no attempt to even mention these variations by name, but the following case illustrates a number of possible pitfalls.

There is first the insidious onset, which in its beginning may so greatly resemble so-called functional disease, as to deceive the very elect. There is the fact that by no means does cerebral tumour always show the well-known triad of headache, vomiting and optic neuritis. There is the fact that growing slowly, as it were underground, the symptoms may be of minimal intensity until there developes a pathology within the pathology, a cyst developes or a hæmorrhage occurs about the tumour, and the little stream of symptoms becomes a torrent and even the wayfaring man has his attention arrested.

A similar state of affairs, *mutatis mutandis*, takes place in an ovarian cyst when a hæmorrhage into the cyst or a twist of its pedicle, converts what is apparently only a nuisance into an acute abdominal crisis.

The case which illustrates these points was a woman of 48 years, from outside the city, who gave as her reason for coming into the hospital that "she was run down and easily tired, and had no appetite, and suffered from headache, and came in for observation." At the risk of wearying you I will quote from a letter from her husband written to me at this time: "Ten years ago we had a very trying experience when our daughter aged 5 was seriously ill with typhoid. She nearly passed away and the strain told greatly on my wife. Two years ago my wife was thrown from an automobile and severely injured, being unconscious for some time. She has probably told you all this, but I will say that she is of a nervous disposition, taking small matters too seriously and given to worrying a great deal. She has felt for some time that nobody has any sympathy for her, and her friends and her family did not realize her condition. She recovered to quite an extent from the effects of the automobile injury, though her head and face have never felt quite right, and her food has never tasted natural to her, and since last August she seems to be failing. For the last 3 weeks she has sat about the house talking about herself. She has some difficulty in seeing, and her eyes would not focus readily when changing from one object to another. She has lately been unsteady on her feet, and last Monday she had trouble in raising her arm to look at her wrist watch."

From this quotation one can see how the onset of her symptoms impressed her husband, who was an intelligent and observant man. To supplement this history, I might say that 15 years ago she had a right kidney sutured up, and seven years ago had been in a hospital with a diagnosis of gastroptosis—the surgical and the medical synonyms for "no disease found."

Such a history does not impress one at first sight in favour of organic disease.

Her headaches came on a few weeks ago, beginning in the morning and wearing off in the afternoon, and did not keep her awake. There was no vomiting. Examination on admission showed only some difficulty in reading, which appeared to be chiefly a lack of attention, which she described as a difficulty in concentrating her vision upon the page.

There was also an extremely slight diminution in power in the left arm and leg, and an apparent lessening of sensation to pinprick on that side. The abdominal reflexes were normal. A few days later she showed distinct weakness on the left side, with Leri's sign, and a marked Romberg's sign, and a left ankle clonus appeared, followed a few days later by a left Babinski's sign and a well-marked left-sided heminopsia and loss of the left abdominal reflex. An external squint and marked myosis developed in the right eye (on the side opposite to the body paralysis), and continual almost athetoid movements of the right hand appeared, and also—what was a very interesting feature—the orbital reflex elicited by tapping over the right eye gave no response in that orbicularis muscle, but tapping over the left eye gave rise to a contraction on both sides. At the same time there developed absence of sensation over the right forehead. These points indicated involvement of the third and fifth nerves at the right base, in addition to a hemiparesis on the left side. Headache became extreme; incontinence developed, and coma came on, with death from respiratory failure.

At no time was there any optic neuritis, and all laboratory tests were negative except a slight leucocytosis from 9000 to 14000.

The spinal fluid was under slight pressure but otherwise negative. A diagnosis was made of cerebral tumour lying above the right peduncle. The autopsy showed a large cystic glioma extending from the island of Reil back to the right occipital lobe and down into the right peduncle, into which a recent hæmorrhage had occurred.

Two other instances of glioma in the temporosphenoidal lobe without vomiting and without optic neuritis have come under our observation during recent months, and I think that the lesson of this case is that the apparently neurotic of all people demands the most intense investigation.

Might I here also bring to attention a sign which is often lightly passed over? I refer to the loss of abdominal reflex. Clinical observation I think proves it to be a sign of very great value and not to be lightly passed over, for when it is demonstrated it raises a presumption of organic cerebral disease.

The next case was at once the most unusual and the most unfortunate of the group. He was a man of 39 whom I saw on a Sunday night with Dr. MacIver, and the picture would have been ludicrous except for its tragedy. He was sitting up in bed with an expression of intense suffering and complained bitterly of pain in his occiput, but withal would alternately whistle and sing; and when asked why he did it he said it was to drown the pain. He had a restless unquiet expression, and a choreic or tic-like movement of his head and right arm and leg. His temperature was normal, and his pulse 108; and a most searching examination showed no sign of any organic disease of the nervous system, but a thickening of the right tibia was found strongly suggesting syphilitic osteitis. No sedative relieved his pain, and during the night he became quite irrational and was removed to the hospital, where a lumbar puncture was done, with great relief to the headache. The spinal fluid showed 23 cells to the m.m. and no globulin; it was under slight pressure.

The mental condition became much more disturbed, he lost sense of orientation, and his speech and motor restlessness were very similar to the state of one with delirium tremens. The temperature rose and remained about 102, and the pulse above 100. His choreic movements became more clonic in type and affected chiefly the right face and arm, and later involved the muscles of the lower thorax and abdomen, as well as the diaphragm. The rapid clonic spasms of the abdominal wall resembled hiccoughs. The voluntary motor power and reflexes were unaltered except for slight weakening of the left abdominal reflex. The pupils reacted only sluggishly and were slightly irregular. There was no disturbance of sensation. There was no Kernig's sign and no retraction of the neck. The blood count showed R.B.C. 5,200,000, W.B.C. 21,500, Hg. 90 per cent. Blood Wassermann and cerebrospinal fluid

Wassermann negative. The pain in the head had now disappeared and was replaced by a descending pain in the back.

On the eighth day he became more irrational and respirations became suddenly more rapid and then ceased.

The history of the illness given by his wife was that five days before the actual onset he had pain and twitching of the left side of the face, he kept at work, but on Saturday and just before I saw him, felt generally unwell, but the severe pain only appeared on the Sunday.

The autopsy showed a gumma in the right testicle and syphilitic aortitis. The brain weight was 1470. The pial tissues were distended with clear fluid, and the brain tissue was more moist than normal, giving the picture of a "wet brain." On section, no areas of degeneration were visible. The small blood vessels throughout the brain were dilated and stood out prominently. No focal areas of hæmorrhage.

Stained sections show the typical lesions found in encephalitis lethargica in the mid-brain and in the pons, especially in its higher levels. Besides the perivascular lymphocytic collar there were areas of cellular infiltration without the blood vessels. There were a few microscopical hæmorrhagia about capillaries of the mid-brain.

The problem here at the onset, in a man without fever, was that of a cerebral syphilis on the one hand and a true psychosis on the other. The subsequent course of the disease rendered a diagnosis by exclusion possible. A negative Wassermann of the spinal fluid as well as the radical departure from the clinical picture excluded cerebral syphilis, and the febrile reaction excluded the psychosis and the ante mortem diagnosis was epidemic encephalitis in a patient with syphilis.

Dr. F. M. R. Walshe (Brain, November, 1920) comments upon the variability of the symptom complex in encephalitis: Whereas the classical lethargic type with nuclear mid-brain lesions is well established, many cases showing abnormal movements such as tremor, choreiform, and myoclonic types have been described, but it is futile to attempt a clinical classification for every type.

Broadly, the following table epitomizes the matter.

General symptoms—

Positive: Delirium, mania, restlessness, hallucination.

Negative: Lethargy, coma.

Focal symptoms—

Positive: Convulsions, involuntary movements, and muscular contractions, atony, rigidity, pains.

Negative: Paralysis.

It is the increasing recognition of "positive" signs as compared with the original "negative" picture that complicates the symptomatology. It may be remembered, however, that the same principles govern the localization of a clonic convulsion as of a palsy.

Cases are reported in which a clonic movement of the arm gave way to a peripheral type of paresis and others where they are associated with pains of spinal root distribution. Choreiform agitation (*folie musculaire*) is constantly associated with great *psychical* excitement, this and its usual termination in death from exhaustion point to its irritative character. The paralytic or negative phenomena seem to have a selective action upon the mid-brain and the basal ganglia, but the irritative effects seem to bear upon neurones of every physiological level from cerebral hemisphere to spinal roots, hence the polymorphic character of the cases showing irritative symptoms; and it is even suggested that the virus may have more than one active component.

The other cause of positive symptoms, *i.e.*, the release of certain regions by the toxic paralysis of upper controlling mechanisms, is not regarded as being potent as a cause of the abnormal movements of encephalitis.

The next case I will bring before you had in it to me most unusual elements. To those working in neurology and psychiatry alone, the picture may be familiar, but in my experience it was unique.

A man of 54, an intelligent and from later observation a very stable-minded Scotchman, an envelope cutter in a factory, while doing his usual work at 3.15 p.m. became suddenly flushed and began to perspire. He remembers opening the window for air and feeling sick, but nothing more until he woke up in the hospital two days later. He was brought to the hospital deeply unconscious but with a placid expression and a good colour and breathing easily. Pulse 72, T. 98.2, R. 20, B.P. 100-145. Heart, lungs and abdomen were normal.There was no voluntary movement, but it was noticed that all of the limbs had moved involuntarily since admission. When lifted, the limbs dropped again, but not absolutely flaccidly. A constant fine tremor of the eyelids was noted, and both lids were firmly closed and the pupils contracted, but reacted to light. All reflexes were present and no abnormal reflexes were elicited.

Sensation to pain was absolutely gone, no response to supraorbital, mammary or iliac pressure. There was no incontinence. A lumbar puncture was done without apparent pain and without the knowledge of the patient. The fluid was clear, not under pressure, and contained no cells and no globulin.

The following day the temperature rose to 101 and there was a well-marked odour of acetone on the breath, and the urine contained acetone and diacetic acid, but was otherwise normal. A leucocyte count showed 10,000 cells. The ocular fundi were normal. After 24 hours he opened his eyes and asked for his wife but relapsed again into unconsciousness, till 48 hours from admission, when he gradually awoke and complained of headache but had no memory of coming to hospital. From this on he steadily improved, and was discharged apparently well in 6 days.

There was nothing in his personal or family history except that for some days past he had been greatly worried by an overhanging financial trouble. The problem here was that of coma of sudden onset, with absolutely no physical explanation. The question of poisoning arose, but no poison would fit the case. There was no history of epilepsy nor any previous mental disturbance.

An apparent explanation was mooted in the acetonuria which he showed, but his blood sugar was .110 and his plasma combining power 60.. and the acetone was attributed to starvation, as a matter of fact it disappeared when he received food. The only explanation to my mind—and I am open to correction—is that of trance or hypnosis as a result of profound mental worry.

Since that time a child of this patient was brought to me with minor epileptic attacks, which suggests a groundwork for the father's attack.

To summarize the cases cited, we have

1.—A cerebral haemorrhage, thought to be intracerebral and pathological but actually on the surface and traumatic.

2.—A man with cardiorenal disease, developing apparently a uraemic seizure, but actually a cerebral haemorrhage.

3.—A hemiplegia without evident cause in which the electrocardiogram assisted in the diagnosis.

4.—An acute streptococcus meningitis with albuminuria and glycosuria.

5.—Chronic pulmonary abscess with cerebral abscess and meningitis, wrongly diagnosed as tuberculous.

6.—Typhus fever with signs suggesting meningitis.

7.—Tumour of the brain developing in a so-called neurotic patient.

8.—Unconsciousness of so-called functional nature in a man of 54.

9.—The clonic type of epidemic encephalitis.

What conclusions may we draw, then, from the hits and misses recorded above?

Is there any means by which we may draw correct conclusions in the face of similar problems?

Just one—that contained in the advice to the painter: "Choose the right colours and put them on in the right place." The colours in this instance being the facts which we can gather together, and the brush work the judgment with which we combine them.

From what sources do our failures in diagnosis arise?

There are several sources.

First: Insufficient and unsystematic examination. We all have learned the routine of the systematic examination of the nervous system; the history, the examination of the mental functions, the cranial nerves, the motor system, the sensory response and the reflexes, the investigation of the eye grounds and of the spinal fluid; but not all of us, all the time, pursue this routine; and thus some of us, some of the time, are tripped up.

One might here refer to the extradural haemorrhage which we let pass as intracerebral by lack of attention to the history. But it is encouraging to us all to think of how many apparently obscure conditions, systematically observed, will march quietly each into its own diagnostic stall.

As the second source of error, perhaps one might mention *the wrong interpretation of evidence acquired,* which implies a defect in judgment.

Clinical judgment is the highest quality of the physician, and it is acquired by means similar to those by which the gardener said that the English lawn was made: "You cuts it, and you rolls it, and you waters it, every day for a thousand years." It springs from a knowledge of the natural history of disease, got from contact with the living, which waters it, and from contact with the dead, which trims it, and from contact with books, which rolls it; and we may all aspire to possess it in some measure if we live long enough.

Another source of many of our errors is the refraction of the cold light of reason as it passes through our preconceived opinions, and of this one example will suffice: Let us once believe that a given person is "neurotic" or "uræmic" and very apparent focal signs may either be ignored or misconstrued.

On the other hand, the quality of *imagination* is essential. It was said of Osler that he had a "flair for the unusual case"; and, imagination in that sense, brings possibilities into one's purview which too conventional an outlook would entirely disregard.

After all, "What's the use?" one may say. "Internal Medicine is simply an attempt to distinguish between a number of incurable diseases." That may be true in nine cases out of ten, but it is the tenth case that makes life worth living.

FINANCIAL CONSIDERATIONS OF THE AVERAGE DOCTOR*

Albert T. Lytle, M.D.

Buffalo, N.Y.

MR. PRESIDENT, Doctors of the Round Table:—

It is but feebly that I express to you my appreciation of the honour conferred by asking me to address you on so important a topic as the "Financial Considerations of the Average Doctor."

That there is real justification for such consideration a recent published statement of Alfred Cox, Medical Secretary of the British Medical Association, but confirms. He writes:

> "The Medical profession, which people have vaguely thought lived mainly on its reputation as a "noble profession" and on the gratitude of the people who could not pay, was discovered to be as amenable to ordinary economic laws as anybody else. Its income and demands for remuneration were discussed in every newspaper and at political meetings all over the country." (A special article, *Journal A.M.A.*, "Seven Years of National Health Insurance in England," by Alfred Cox, M.B., B.S. (Durham), Medical Secretary British Medical Association, London, England, May, 1921).

I desire to apologize for the fact that quite all that follows is drawn from conditions in the United States, with its mixed population of one hundred and ten million, and particularly in the Empire State of New York, with its twelve million cosmopolitan population of whom 25 per cent. are foreign born from all quarters of the globe, and its fifteen thousand licensed physicians.

Economic and Social Standards, Definitions and Principles

I think all of us have been brought up in the idea that our vocation is a profession of special knowledge in that department of learning called medicine, and, in the idea that medicine is an art. Indeed, the professions of theology, law and medicine were for many years the only professions. A doctor of such was considered as made of a little better than common clay—a great deal better than the manufacturer or the merchant. Today, the latter's calling stands at an equal premium. The word "profession" implies attainments in special knowledge as distinguished from mere skill; as a vocation it indicates the application of such knowledge to uses for the benefit of others, to be distinguished from its pursuit for one's own purposes. This interpretation infers the elimination of quite all those principles and practices that govern business relations.

Recently one of New York's more liberal college professors, an able politician of the Roosevelt type, stated: "The two chief public issues are international relations and industrial relations, and industrial relations are the more important." In other words, civilization is now living in an industrial age, hence, all activities, all vocations are coming to be measured by industrial standards. The ideals of art and science are giving way to the necessities of industry. The pressure of industrial standards particularly is marked in those professional pursuits that come into immediate and intimate relations with industrial activities. Today, medicine is being supported by the two great factors of industry—capital and labor—and by this vital contact is bound to be greatly influenced by its aims and morals. Medicine also has been swept into the mælstrom of modern civilization, the turbulent currents of which are producing prodigious changes in every walk and enterprise; one wonders if all this change evidences the next mutation of civilization.

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*Read before the Meeting of the Ontario Medical Association, Niagara Falls, June, 1921.

Whereas, in the near past in the community the physician was a powerful, social and political leader, and his relations to his patients and friends most intimate, tender and influential; today he occupies a place far inferior in influence to that of the once-disdained business man; whereas formerly the physician's income largely expressed appreciation for his deep interest in and his great personal sacrifices for the welfare of the community; today, his services are regarded much in the same light as are business commodities. It is trite to say that the doctor is and always has been a poor business man; yet, indeed, to such an extent is this statement true that it is rare to find a physician whose financial status at all compares with that of a business man of like ability; at the same time his responsibiilty for the welfare of the people and to civilization far exceeds that of the richest business man. Notwithstanding the importance of its duty, notwithstanding the marked personal sacrifice of its members, when compared with other professions, except possibly that of the church, the profession of medicine is of all the poorest paid.

It is fairly well-determined that "No man can become rich through the practice of medicine"; also "It is a fairly recognized fact that members of the medical profession who are rich either have inherited their wealth or married it, or made it by dividing their attention between scientific medicine and some form of business, to the detriment of scientific attainments."—(J. M. Swan, M.D., unpublished). It is some comfort, however, to read a statement of the Chairman of the United States Federal Trade Commission, in which he says: "Out of two hundred and fifty thousand business corporations that reported to the Federal Trade Commission, one hundred thousand showed no net income at all; the average of business successes is only slightly better than fifty-fifty. One half of all the people in business in this country do not know from day to day whether they are making money or losing money. They may think they know. They may tell you they are making money, or they may tell you they are falling behind. But, in either case, they will be only guessing. They cannot know accurately for they have no cost books and thus no way of determining costs. They frankly work by rule of thumb." (Edward E. Hurley in the *American Magazine*, April, 1921). This also is overwhelmingly true of physicians. Possibly present-day more stringent income tax laws may arouse the doctor to the necessity for a better knowledge of his economic condition and responsibility.

SELECTION OF MEDICINE AS A VOCATION

When an individual contemplates a business career he usually determines the line to be followed strictly from the standpoint of financial return on the investment and for the effort, although circumstances, taste and association may influence the decision. I always have been curious as to why an individual should select a profession, and particularly that of medicine. Each knows, or thinks he knows, just why he selected medicine for a vocation. I think the true reason will fall under one or more of four heads: adaptability, sentiment, social advancement, financial. I think that those who follow medicine actuated by the first two reasons generally make the greatest success from a purely professional point of view, and that the majority of those who do so from the two latter motives are unsuccessful, both professionally and economically.

In the halcyon days of yore, when a young person decided to take up a business, a trade, or a profession, he apprenticed himself to a more or less master of the calling. To my mind it is to be regretted that this old method of apprenticeship is today not available for the medical aspirant for, under the tutelage of and intimate association with his preceptor, he early became aware of the possibilities and probabilities of the future; he either abandoned his purpose while yet a very young man when he found the obstacles too unpleasant or too impossible, or, else he continued his career, gradually absorbing from the experiences of his preceptor much of practical knowledge affecting favourably and unfavourably professional and economic success. Powerfully in these industrial days is the economic inducement pressed to the fore in all human affairs while idealism languishes; the validity of making the economic motive the guiding factor in the practice of medicine in place of the spiritual motive is a moot question.

Location for Practice

In industry, after one has chosen an occupation, the next thought is in regard to the selection of a favourable location, one that will secure the greatest opportunity to attract patronage, to make sales and secure profits. Much thought and consideration is given to this particular phase of a business career. It is doubtful if he who enters the practice of medicine gives to this important question the full and proper consideration of all those varied elements that enter into an ultimately successful professional career. All too often circumstances compel the single desire for real wealth (money) to determine this step, rather than the aspiration for that intangible, immaterial wealth the possession of which brings honour and renown, friendship and happiness, affluence and contentment.

Competition

The keen business intellect, before investing money, time and effort in any hazard, carefully considers his rivals and their competition; he attempts to vision their effect upon the possible growth of and income from the venture. It is questionable if the same consideration is given to this subject by one about to select the profession of medicine. Competitors, in medicine, may be divided into two great sections: (1) that formed of compeers, and (2) that composed of heterogenous groups. Competition from the first division is stimulating and helpful. In the latter is the group that includes the fee-splitter, the renegade-doctor, the cheap contract doctor, the advertising doctor, the sectarian doctor, as the osteopath, the chiropractor, the naturopath, the hydropath, the electropath, the magnetic healer, the christian scientist, the faith healer, the mental healer and their ilk. Another group includes the trained nurse, the untrained nurse, the pharmacist, the patent medicine concerns, the relic worshippers, and many others. Still another group includes the "closed shop" hospital and dispensary, the diagnostico-therapeutic clinics, the medical branches of social welfare organizations of various charitable bodies, boards of health, and others. With all of these must not be forgotten the immense group of self-prescribers and sympathetic neighbours who know more about diagnosis and treatment than educated and experienced physicians.

On comparing the population of the United States with the known list of licensed medical practitioners it is found that each practitioner must obtain his livelihood from an average of seven hundred souls, or rather bodies. Could he vision the magnitude of the competition the would-be medical student would be appalled and so abandon the project. Only those made of such stuff as the sturdy knights which your Round Table so happily apostrophizes would gird on the armour and fight the good fight to a winning finish.

Investment

Preparation for the practice of medicine requires much more of time and money than that of any other vocation. Those entering the private practice of medicine do so at an age about twenty-eight, many years (at least five) beyond those in any other calling The long time of preparation (now seven years), the close application to studies (now nine months in every year), demanded in the medical curriculum of today; the inability to come into that association with older and more experienced practitioners that obtained in preceptor days, brings the new physician into the field of active private practice practically ignorant of the economic and ethical problems facing him, and with little or no knowledge of ways and means properly and dignifiedly to practice his scientific art. A feeble effort to counteract the unwholesome effects on the profession of this deprivation is seen in the recent establishment of lectures on Medical History, Ethics, and Economics required by the Regents of the University of the State of New York.

How few physicians ever have stopped to figure up the amount invested, both positive and negative in value, in the "scrap of paper"—the diploma—which secures to the owner the degree Doctor of Medicine, and the right to practice medicine in any modern state.

It is a well-known fact that all higher educational institutions teach and graduate students at a very great financial loss, depending on gifts and endowments to keep the school a "going concern"; this is particularly true of medical schools. The American Medical Association claims that of the one hundred and sixty real medical colleges existing in 1900 only eighty-six were going concerns in 1920, and that some of those were wobbling. That while the average annual tuition charge to the medical student is $150.00 plus, the average annual cost is $450.00 plus per student, the high mark of cost being $1,200.00 plus per year—a loss of from $300.00 to $900.00 per year per student with no allowance made for the value of unpaid teaching. Is this good business? From these figures it is very evident that from an economic standpoint the teaching required to secure a medical education—the diploma granting the degree Doctor of Medicine—is sold at a prodigious financial loss that immediately would wreck any modern business concern. The medical student therefore can have no complaint of the high cost of that part of his preparation to practice which has to do with medical teaching.

A successful American captain in industry says: "No man has a right to be in business unless he knows his costs." From a purely economic standpoint this also is true of the physician.

Considering the importance of medicine to the public it is inexplicable that there is such a paucity of statistical data regarding all the economic elements that enter into its practice. No authentic figures are extant; all statements regarding costs and returns are very difficult to obtain, indeterminate and extremely unreliable. To comply with the requirements of the Regents of the University of the State of New York, the Medical Department of the University of Buffalo gives to the senior students several hours on the topic of Medical Economics. This medical school is among the very few actually giving such a course. In an effort to secure some figures covering the cost of a medical license for this course I was able to compile the following figures from data secured in 1915, before the era of the "high cost of living":

Cash spent— positive expenditure $2925.00:	
(a) Medical tuition and fees, 4 years	$ 800 00
(b) Books and instruments, 4 years	125 00
(c) Maintenance 5 years—4 college, 1 hospital	2000 00
Cash lost—negative expenditure—$4045.00:	
(d) Wages lost, 5 years (age 19 to 24) at $750 00	3750 00
(e) Interest at 4 per cent. on $2925 00 for 2½ years	295 00
Total	$6970 00
Beginning with the year 1919 there would be added 2 years of Arts College work, estimated in 1915 as amounting to an additional cost of	3350 00
A total capitalization for gradution in 1923, based on 1915 figures, of	$10320 00

The war increased living costs over one hundred per cent., while the value of the item "lost wages" advanced as high as 400 per cent. As yet both have not fallen materially, therefore in 1920 $20,000.00 as the capitalization of the license entitling the holder thereof to the right to practise medicine in New York is neither a fanciful nor an inflated sum.

Allowing then that the physician is about to start the actual practice of medicine with an investment, or expenditure, or capitalization, of $20, 000,00: the cost of what other items must be added to it to determine the gross investment in the business of practising medicine? They are office equipment and transportation system. At today's prices these items probably would represent not less than $5,000.00. It may be stated then that to begin the active private practice of medicine a capital of positive and negative investment amounting to $25,000.00 is required. At this point begins the struggle to make a "going concern" of the business end of the practice of medicine, and so difficult is it that statements are made that out of one hundred graduates only ten are in the private practice of medicine after ten years.

A very successful manufacturer gives the following as his scheme to determine the allocation of the various items for a successful business of the year to come. From the gross value of the last year's business he estimates that for the year to come. From this estimate he deducts what he considers the normal net profit. Twenty per cent. is his average figure for net profit on ordinary commercial turn-over; therefore 80 per cent. of the estimated gross sales may be consumed in the legitimate expense of doing business, and allocated to raw material, stock, labour, selling, amortization and "overhead." At the end of the year if the amount allocated to each particular cost exceeds the estimate an effort is made to determine the reasons why and an attempt made to correct the excess cost for the next year. Of course if the 80 per cent. allowed for costs is exceeded, then the 20 per cent. profit is reduced, and vice versa. It must be remembered that the profits are not based on percentage on investment but on volume of business. Obviously, no such method for the determination of the volume of business for any year is possible in the practice of medicine.

Costs

The individual physician with a capitalization of $25,000.00 to be a "going business concern" from the very first year must have an income large enough to cover certain practically fixed items chargeable against it. The United States Government during the war allowed manufacturers starting or converting factories for munitions cost plus 10 per cent.; this included a certain per cent. for amortization and for interest upon capital investment.

Applying this principle to the doctor's investment, he should receive yearly up to 10 per cent. on $25,000.00—that is, $2,500.00 as an interest return on the capitalization. It properly may be stated that the investment in the right to practise medicine hardly can be considered as requiring a yearly reduction for amortization as does a manufacturing plant or a merchant's outfit; rather each year adds a positive increment, due to experience, to the value of the doctor's investment. During the doctor's life his investment in immaterial wealth is never impaired by fire or other accident, and never will it become a complete loss unless he abandons the job; yet, the estate of the doctor never even by a sale of good will realizes upon the original investment, let alone upon the intangible increment added by success, experience and large clientele of a long life.

Another amount should be forthcoming each year as a return for managerial skill in handling such a capital investment, the result of the many years of study and preparation and experience. This sum is an extreme varient as it depends so much upon personal equation. Based upon the values awarded to like management of a business with a $25,000.00 capital, it at least should be another 10 per cent. of the investment or $2,500.00.

A third additional sum must be earned to cover annual operating and overhead expenses. This item includes rent, office expenses (such as light, heat, electricity), drugs and chemicals, replacement and repairs of instruments and surgical supplies, transport operation and upkeep, technical books and magazines, and society dues—a sum that would foot up at least to $2,000.00. Now if the assumptions are correct, then each year should see the average physician earning from the practice of medicine alone not less than a total of $7,000.00; no net profit has yet been recovered. Mind you, from this sum must come the living of the doctor and his dependents as well as his personal expenses.

INCOME

What data are available in regard to medical incomes to prove the theoretical assumptions? From the United States census of 1910 an estimate was made that $300,000,000.00 were spent yearly for medical service. In 1915 in round numbers one hundred and fifty thousand graduate, licensed physicians were practising in the United States; a fair guess would add one hundred and fifty thousand irregular healers, and three hundred thousand is obtained as the total number of practitioners receiving money for medical services. From these figures the average annual income of the physician of the United States in 1915 was about $1,000.00. In the State of Wisconsin in 1916 the State income tax gave $1,488.00 as the average annual income of Wisconsin physicians. In 1916 the United States federal income tax was paid by thirty-two of the three hundred physicians in the city of Richmond, Va; as the maximum exemption was $2,000.00, this statement leaves the inference that in 1916 the net income of the physicians in Richmond, Va., did not average $2,000.00 per year. An unauthorized, unverified statement published in 1919, asserted that the average income of the physicians of the United States was $3,907.00 per year. In 1920, the chairman of the Committee on Economics of the Medical Society of the State of New York published a series of figures of income and expenditures as the result of an unverified survey of about 50 per cent. of the licensed profession in the State of New York from whom were received about four thousand replies. The questionnaire was so arranged that the answers fell under three groups, one designated as general practitioners, one as all-time specialists, and one, devoting considerable time and attention to some specialty, as part-time specialists. The population areas from which the answers came were divided into eight groups: the city of New York, the city of Brooklyn, each with over two million inhabitants; cities of one hundred thousand and more; cities of fifty thousand to one hundred thousand; cities of ten thousand to fifty thousand; large towns of twenty-five hundred to ten thousand; small towns under twenty-five hundred, and institutions. The figures as taken from the August 1920, *New York State Journal of Medicine* are:

NEW YORK—2,000,000 plus:

	Income	Expenses
General practitioner	$ 5876.92	$2355.63
Full special.......	12717.50	4280 42
Part "	9022.71	3183.23

BROOKLYN—2,000,000 plus:

General practitioner	5691.35	2161.72
Full special	11691.43	3286.80
Part " . . .	6269 07	2102.90

	Income	Expenses
SECOND CLASS CITIES—100,000 plus:		
General practitioner	$3635.55	$1853.58
Full special.......	8604.16	2502.38
Part "	9037.50	3011.75
THIRD CLASS CITIES—50,000 to 100,000:		
General practitioner	3554.34	1004.00
Full special.......	6439.00	3375.00
Part "	10745.00	3687.50
FOURTH CLASS CITIES—10,000 to 50,000:		
General practitioner	4766.40	1752.70
Full special.......	9101.47	3774.86
Part "	8544.33	2759,18
LARGE TOWNS—2,500 to 10,000:		
General practitioner	5275 88	1729.96
Full special.......	6175.00	2700.00
Part "	5776.33	2078.75
SMALL TOWNS—under 2,500:		
General practitioner	3419.68	1222.26
Full special.......	3575.00	1125.00
Part "	4666.66	1466 66
INSTITUTIONS.......	4002 01	660 50

The tables show that the average annual income of the "average doctor" runs in the neighbourhood of $4,000.00, but that the average expense (about $2,000.00) only covers the last one of the three assumed items which an accountant would charge against income to determine profit and loss in a business concern.

The figures quoted are of course averages, and not proportionate in the population areas. Among the large incomes reported were some at $90,000.00 and some at $125,000.00. As in the State of New York there are about fifteen thousand licensed physicians, the compilation of four thousand unverified patchy returns is hardly representative or determinate; the replies probably came only from those with incomes at the higher level of medical return as well as with both social and professional success.

If the ratio of population to doctors is as seven hundred to one; if my assumption that $7,000. is required as annual income to make the doctor's business a "going concern," then each citizen of the seven hundred should have at least $10.00 in his annual budget for medical service. Social welfare workers and living-wage statisticians allow for such service in the annual budget of the standard family of five approximately $30.00, or $6.00 per person, which figure allows $1,200.00 minus for the income of the "average doctor."

In 1919 the New York State medical professoin was violently agitated, after the then fact had become a dead issue, because they accepted without verification the statement that if a certain legislative bill creating state compulsory health insurance became law, the doctor was bound to make an impossible number of daily service calls for a far, far less unit price—six cents I believe—than he was securing from the methods then operative. Reports of the disastrous working of the British Insurance Act were exhibited as horrible evidence. A recent article from the pen of the medical secretary of the British Medical Association states that about thirteen thousand doctors are taking care of some fourteen million individuals under the British Insurance Act, or about one thousand individuals to each physician. He shows from easily provable statistics that these one thousand potential patients secure to the panel doctor an annual income in the neighbourhood of $3,000.00, while the actual attendance is about 3.8 per insured person, of which 90 per cent. would be office items —a rate about that of the pre-war fees of the "average doctor"; to this sum it was and is possible to add a variable but satisfactory amount for private attendance. To the cool, calculating, scientific observer the hysterical demonstration of the New York doctors against a dead bogey and their following the lead of demagogic orators skilfully using hyperbole and half-truths must have raised serious doubts of the vaunted intelligence of the medical profession. For so learned a body only to have a vision only microscopic and never telescopic is one of the anomalies of the day and age.

The figures from the various sources nevertheless .seem harmonious. The smaller average incomes are pre-war figures; they should be doubled when compared with the larger post-war figures. However, if my assumption is right and just that the physician to be a "going concern" should have a minimum gross annual income of $7,000.00 from the practice of medicine alone, while available data go to show that probably he receives nearer $3,000.00, then it is fair to believe that as a money-making venture the practice of medicine never has had and never will have very great possibilities.

That large numbers of physicians readily accept, even persistently and eagerly seek, cheap contracts like lodge practice, industrial insurance examinations, low-priced part-time governmental positions and many other poorly-paid medical services, rather forces the conclusion that the practice of medicine as a business venture is not a "going concern" for several years after the primary investment has been made. This lack of proper financial return from the old-time family practice may be an explanation of the rapid rise of spurious specialism and the increase in the number of dangerous surgeons.

In industry it is an economic law that wages shall be in proportion to the value of the output. Applying this law to results of available data on the actual average medical income, and on the assumed theoretic necessary minimum medical income, it must suggest to the scientific economist that medical services are not very valuable. I ask: Does not the enormous volume of quackery rather support this view?

Medical Economic Problems

Permit a digression to congratulate and commend your society in the forehanded, careful, broad-visioned way in which it has taken up the investigation of medical economic problems now facing the profession and the public, and in its endeavour to reach proper, equitable, justifiable and definite solutions to put before the people and the government before inconsiderate mandates are issued. Reliable and accurate statistics on sickness incidence and care should be compiled before any movement to determine medical values, and this your committee is doing. In your considerations of the problems of state health insurance and state medicine, state medicine should be clearly defined. Another problem is to determine, at least within reasonable limits, the value of that which for want of a better name I have called service-value. In so far as strictly professional relations go, the service-value of the care of any disease is the same irrespective of the political, social or economic status of the individual attended. It also is obvious that the remuneration for service will depend upon those very factors that do not enter into the make-up of service value. The statistics compiled from state health insurance activities in other countries soon will work out a reasonably accurate account service-value for various medical and surgical procedures based upon which can be determined a proper minimum remuneration for the "average doctor." Another problem which must be solved is the minimum annual income which properly shall compensate the "average doctor" for his capital investment and for his years of sacrifice, and which also shall permit him properly to develop and to live. To my mind the solution of the problem of quackery and self-prescribing is one of education of the public and the medical profession must be the teacher. That the hospital and hospitalization are real medical economic problems I read without comment a statement made on the 101st anniversary of the birth of Florence Nightingale by a lay director of a national hospital association:

> "The perfection of our hospital system has had the result of institutionalizing over 25 per cent. of medical cases and perhaps 99 per cent. of surgical and accident cases. It is time that the public in general, and not merely the hospitalized portion, learn the value of our hospitals as health assets."—*Buffalo Express.*

A Solution?

What will be the economic outcome during the next few decades? The economic side of the profession of medicine will have to be re-adjusted in a very radical way, beginning with the pre-medical period. Some form of what for a better name must now be designated as "state medicine" inevitably must come. The purchasing power of the great majority of citizens at present-day normal wages will be inadequate properly to remunerate the "average doctor" for average present-day medical services, based on the doctor's capitalization.

On the hypothesis that normal health preservation is a dominant factor in preserving civilization; on the hypothesis that democratic goovernment is dependent upon a hifih average of public health on the hypothesis that industrial efficiency is controlled by sustained individual health, and, on the hypothesis that the maintenance of such health conditions is in the hands of a properyl qualified and skilled medical profession—I believe that it is the duty, as well as the privilege, of governments to enlist properly qualified citizens beginning with pre-medical ages at a proper remuneration for the purpose of creating and maintaining a corps of physicians who for a greater or less time, according to the desires and ability of the individual physician, shall practice medicine as government officers especially among those unable or unwilling properly to care for their sickness incidence and to protect the health-welfare of themselves and their dependents. I always have felt that the enormous amount of gratuitous service cheerfully and freely given by physicians in hospitals, dispensaries and elsewhere is a grave social injustice, notwithstanding the fact that in the past such service was of great value to the individual physician in securing to him sufficient experience and in permitting him ethically to advertise. I believe that the unjustly low remuneration of the "average doctor" and the high financial cost of his preparation are in large measure the exciting causes for the acceptance of contracts that lower morale, and, for such unethical unwise, if not illegal arrangements as the splitting of fees, lodge practice and like contracts. I firmly believe that within a relatively short time if the economic side of the physicians' calling is persistently ignored new alignments will take place, such as diagnostic-therapeutic groups, both extra- and intra-institutional, that will rival quack institutions.

To the student group that I annually address, I say: "Do nothing to belittle the value of medical attendance; so act that those served will appreciate the service-value of the service rendered and will recognize that the remuneration is inadequate." I tell them that it makes no difference as to what the actual charge is in dollars and cents, providing so great a demand is created for the service by the quality thereof that one quickly passes from the position of an apprentice through that of a fellow-craftsman to that of a master. I emphasize that once a master's position is secured the actual money, wages or income is sure to grow by leaps and bounds, for then the quality of such service is not of the type peddled on every street corner; that to attain and to retain a master's position requires continuous sacrifice for years, but that it results in all that the most optimistic could desire; that one should never envy but ever emulate a more successful medical friend, should always remember that the common laborer is, even if poorly paid, of great importance in industry, as no project can be completed without his help.

Hard unremitting toil little relieved by the amenities of life is the economic law of medicine for every physician who desires truly to become successful; to become the master artist in the greatest of professions demands that one's motto shall be "I serve." Says Chaucer:

"With us ther was a Doctour of Phisik,
In all this world ne was ther non him lik."

The Spirit of Revolt—Psychologists today are more concerned with the changing spirit of mankind than with any other psychologic problem. The literature on the spirit of revolt, of restlessness, of lawlessness and of radicalism is daily becoming greater. The subject is engaging the attention of our greatest minds. Thus, James M. Beck, Solicitor-General of the United States, devoted the presidential address before the annual meeting of the American Bar Association, held recently at Cincinnati, to this subject. There is throughout the world today, he pointed out, a revolt against the spirit of authority. Pending criminal indictments in federal courts have increased from 10,000 in 1912 to more than 70,000 in 1921. The losses from burglaries repaid by casualty companies have grown in amount from $886,000 in 1914 to over $10,000,000 in 1920. The streets of our cities are as unsafe as were the country roads in the days of Dick Turpin and Jack Sheppard; and murder, the most serious of all crimes, is so frequent as to excite hardly passing attention. In New York, according to Mr. Beck, there were, in 1917, 236 murders with only sixty-seven convictions; and in 1912, 221 murders and seventy-seven convictions; and in Chicago, in 1919, there were 336 murders and only forty-four convictions. If these facts so near home arouse pessimism, how much more serious is the world-wide prevalence of political revolts, enormous uprisings against constituted authority in numerous countries, strikes involving hundreds of thousands of men, and vast fortunes wasted in the pursuit of pleasure. In searching for the cause of the situation, Mr. Beck traces it not only to the rise of individualism which began in the eighteenth century and which had steadily grown with the advance of democratic institutions, but also to the prodigious development in invention and mechanical aids to human achievements so that everything points to quantity of production rather than quality. Man has become a tender of machines rather than a constructive thinker. The increase in potential of human power has not been accompanied by a corresponding increase in the potential of human character.—*Jour. A.M.A.*, October 8, 1921.

A CALL-IN REPORT ON THE LATE RESULTS OF SURGICAL TREATMENT OF CONSTRICTING BANDS OF THE LARGE INTESTINE TERMINAL ILEUM*

W. A. Bigelow, M.D.

Bigelow Clinic, Brandon, Man.

I DO not wish to discuss the subject of intestinal stasis, but simply to present a report from our clinic of the end results of one hundred and five cases operated upon for intestinal bands or membranes. Last winter we determined, if possible, to get in touch with all "constricting band" post-operative cases, and find out, by call-in report cards, what had been accomplished by operation. One hundred and forty-seven questionnaires were sent out, and one hundred and five responses were obtained. Thirty letters were returned "uncalled for," leaving twelve who did not respond. These reports gradually drifted in, and, as it became evident that the results would be more satisfactory than anticipated, we decided to summarize them for presentation before this Association.

1.—*Selection of cases.* Much care was devoted to the reading of the histories, and to a critical study of the diagnosis and operative findings in a large series of cases in which intestinal banding was present. This was done with the purpose of eliminating all band cases associated with gall-bladder disease, acute or sub-acute appendicitis, tuberculous peritonitis, and with gynæcological pathology. Duodenal band or membrane cases were also excluded from the report. We recognize well the difficulty of eliminating the appendix as the active source of the trouble, but no report card was sent out where an acute or sub-acute appendix was anywhere evident.

2.—*Diagnosis.* The diagnosis in all the cases reported was made by Dr. Carter in connection with his regular routine examination of the gastro-intestinal tract by the *x*-ray opaque enema and opaque meal. The investigation, however, did not stop at the *x*-ray room. All were carried through a complete examination by the various members of our Clinic, and a final diagnosis made of "constricting bands" of some part of the large intestine or terminal ileum.

3.—*Main subjective symptoms.* In order of their frequency, the main subjective symptoms are classified as follows:

Table I.—Main Symptoms

(1) Loss of ambition, easily tired, weak, etc., nearly all; (2) abdominal pain, 65 per cent.; (3) obstinate constipation, 42 per cent.; (4) headache, 13 per cent.; (5) gas tumour, 12 per cent.; (6) nausea, 8 per cent.; (7) slight urinary disturbances accompanied by colon bacillus culture from the urine, a few cases.

I am sorry we have not had time to ascertain the exact percentage of the 105 operated cases which gave colon culture from the urine.

4.—*Clinical findings.* As stated above, all these cases, as demonstrated by the *x*-ray, using the barium enema and meal, showed definite constricting bands of some part of the large bowel or terminal ileum.

(*a*)—*The location of bands* and the order of frequency of their occurrence is shown in Table 2. It will be noted that the cæcum and ascending colon were affected in 79 per cent.

Table II.—Location of Bands

Sigmoid and descending colon, 9 per cent.; splenic and hepatic flexures and transverse colon, 9 per cent.; terminal ileum alone (Lane Kink), 3 per cent.; cæcum alone, 22 per cent.; ascending colon alone, 3 per cent.; terminal ileum and cæcum, 20 per cent.; cæcum and ascending colon 26 per cent.; terminal ileum, cæcum and ascending colon, 7 per cent.; cæcum to transverse colon, 1 per cent.

(*b*) *Etiology and pathology of bands.* It is not my purpose to discuss the etiology and pathology of these bands. You are all familiar with their gross appearance on opening the abdomen.

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*Read at the annual meeting, Manitoba Medical Association, Winnipeg, November 9, 1921.

(*c*)—*Localized tenderness over the banded area.* This was demonstrated in 40 per cent. of the cases. Thirty-two per cent. showed right-sided tenderness, and eight per cent. left-sided.

(*d*)—*Secretory digestive disturbances.* Over 87 per cent. showed secretory digestive disturbances, as indicated by the amount of free HCL measured after a 50-minute Boas test meal. Hyperacidity was present in 59 per cent. of the cases, while 38 per cent. showed lessened free HCL.

(*e*)—*Secondary anæmia.* Twelve per cent. gave an average red cell blood court of less than four million.

(*f*)—*Leucocyte count.* The average white blood cell count was 7400.

(*g*)—*Duration of symptoms.* The average duration of symptoms was four years.

(*h*)—*Pathological report on removed appendices.* It is interesting to note that the pathological report, made by Dr. Peirce on many of the appendices, removed during the band-severing operation, showed no evidence of disease. In a few of the cases, however, the appendix acted as an immobilizer, and by its fixation, produced banding of the cæcum and ascending colon. It is to be regretted that all appendices removed were not sectioned in the laboratory.

5.—*Analysis of reports received.* In the questoinnaire sent out the following details were asked: (1); Are your symptoms any better? (2) Are your symptoms much improved? (3) Are your symptoms completely relieved? (4) What changes have been noted in *a* Digestion; *b* Pains in abdomen; *c* Bowel movements.

The history number was placed on each card, so that as soon as the report was returned it was filed away with the history and the operation record. The classified analysis of the reports received is shown in Table 3.

The results in the way of symptom relief are sufficiently noteworthy to challenge the attention of anyone interested in the surgery of the pathological abdomen. Especially is this true when it is noted that fifteen per cent. of these operated cases had had the appendix removed at a former operation without relief from the symptom complaint.

Table III.—Analyses of 105 Reports of Operative Results

General symptoms—Completely relieved, 37 per cent.; much improved, 45 per cent.; improved, 15 per cent.; no better, 3 per cent.

Individual symptoms—(*a*) Digestive disturbances: Completely relieved. 74 per cent.; partly relieved, 23 per cent.; no better, 3 per cent.

(*b*) Pain in abdomen: Completely relieved, 62 per cent.; partly relieved, 34 per cent.; no better, 4 per cent.

(*c*) Constipation: Completely relieved, 68 per cent.; partly relieved, 20 per cent.; no better, 12 per cent.

Fifteen per cent. of these cases had appendix removed previously.

6.—*The operation.* In none of the cases was a short-circuit operation or a cæco-sigmoidostomy done. The following points in the operative technique we regard as particularly important: The careful freeing of all kinks, and the cutting away of all bands; particular care to stop all bleeding points on the bowel wall, using very fine catgut and cutting the ends very short; careful application of a good layer of vaseline over the banded area; occasional longitudinal stitching of peritoneum over the raw areas; occasional covering of raw areas with detached omentum. The bowels are moved the day after operation, if possible. Eserine (gr. 1-100) is given three times a day for one week. Position of patient changed frequently. The bowels are filled daily with large enema. Patient is usually placed sitting up with back rests and pillows on the third day.

7.—*Subscquent examinatic..* The majority of these cases are given a barium enema after leaving the hospital and a fluoroscopic study made of operative results. It has been generally a source of great satisfaction to receive the report that colons which previously showed delay from bands now fill normally.

LESSONS LEARNED FROM A STUDY OF THE GALL BLADDER*

F. N. G. Starr, C.B.E., M.B., F.A.C.S.

Surgeon, Toronto General Hospital, Toronto

IT is my desire to-day to discuss with you some of the phases of gall bladder disease and its treatment, not wholly from the standpoint of the surgeon, but as one practitioner with another. Perhaps I may be of some help to you in your problems; and I know, if you will but talk, that you can be of a great deal of help to me.

First of all, let us clear the stage from such useless and antique furniture as the terms "acute indigestion," "gastralgia," or "neuralgia of the stomach." Those are terms for which no gastric pathology can be defined, and you know and I know when they are used that we are but cloaking our ignorance in order to hoodwink ourselves as well as our patients! When a patient consults me and with a long face tells me he has recently recovered from a severe "neuralgia of the stomach," I invariably enquire who his medical attendant is, in the hope that such an one did not pass through my classes when I taught anatomy. Think for one moment, gentlemen! Are there any sensory nerves, as such, going to the wall of the stomach? There is the pneumogastric nerve, it is true, but does damage to it cause pain? I think not, for upon opening the abdomen under local anæsthetic one may handle the stomach with impunity—may even excise portions of it without pain, provided one does not pull upon or pinch the mesentery in which there are sensory nerves. Then how in the wide face of time can there be a "gastralgia"?

If a patient has severe pain in the upper abdomen, there must be pathology, and it behooves us to be a little more painstaking in our methods of examination and to endeavour to determine what that pathology is.

In the place, then, of this discarded antique furniture, let us put acute and chronic cholecystitis, with or without gall stones; acute and chronic pancreatitis, associated with gall bladder disease, rupture of a viscus, as well as a possible cancer. I want to make it clear that in order to diagnose cholecystitis there need not be a history of gall stone colic, for the gall bladder may be a "hell-deserving sinner" for many years before gall stones, pancreatitis or cancer develops. If it is discovered sufficiently early and dealt with, these more serious death-dealing diseases will be prevented.

In our series of operations for gall bladder disease during 1920, only 5.2 per cent. had jaundice or a history of previous jaundice, so that we don't look upon this as a necessary factor in arriving at a conclusion. If it is present, or if there is a history of it, of course it materially assists us in arriving at a decision.

The taking of an accurate history is essential, and with a little patience and perseverance the patient will so accurately describe his condition when he gets through telling about "it" and when one finally discovers what he means by "it" that he will lead you by easy stages to the location of his pathology. Just here let me say that the taking of a good history is an art—the interpretation of the history, is, however, a science. If one is careful and accurate, sooner or later the patient will "let the cat out of the bag" and lead one to an interpretation of the correct pathology.

This paper is based largely upon the replies to a questionnaire recently sent out to our gall bladder cases operated upon in 1920. One of the first things to which I wish to draw your attention is that gall bladder disease does not belong to advanced years—the average age at the time of operation was 41 years, the youngest was 16 years, and she had gall stones; the oldest was 77 years. In going into the histories of these cases, however, we find that thirteen per cent. had pain, headaches and bilious attacks before 10 years of age; an additional 10.4 per cent. between the ages of 11 and 16 years; an additional 14.2 per cent. between 17 and 25 years; 10.4 per cent. from 25 years on; or 36.6 per cent. had symptoms before 25 years of age. What does this mean? It means that these people were suffering from cholecystitis, but treated for "stomach trouble" and what not, dosing with all sorts of nauseous drugs for years before a definite determination was made to get rid of the disease. It is a very grave question if the cases operated upon years after the initial symptoms have occurred will ever be entirely and continuously free of discomfort, because of the associated pathology that has occurred in the liver or the pancreas from a spreading inflammation, and even in the stomach from repeated reflex spasm.

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*Read at Canadian Medical Association, Halifax, July, 1921.

Some patients complain of pain and refer it to the right costal margin, others to the epigastrium, and associated there with pain also in the lower dorsal region. In 9 per cent. there was a distaste for food. In 18.1 per cent. there was a fear of eating, because of the consequences. In 24 per cent. the appetite was good. We have observed in many of these cases that the 8th, 9th and 10th dorsal roots on the right side are tender to pressure, and if the condition is acute, there is a definite hyperæsthesia not only just below the right costal margin, but also over this area. Very often the patient volunteers the information that he hesitates to take a long breath because of the distress that it creates. Sixteen per cent. complained of constant distress within one-half to one hour after eating. In 3.8 per cent. only did this distress depend upon the size of the meal, and the same applies as to the time of taking it, but in 22.7 per cent. the distress occurred depending upon the kind of food taken, especially fats, or fried food, and in a few of these, vegetables. In 32.4 per cent. the chief cause of complaint was gas on the stomach, sometimes beginning while eating, often preceded by nausea, frequently in from fifteen minutes to one hour after. Often a patient with chronic gall bladder inflammation sits down to the table with a good appetite, but the sight of food causes nausea. In 32.4 per cent. there was constipation. In only one case was there diarrhœa—while this occurred, there were exacerbations of pain in the upper abdomen. Seventy-two per cent. of the constipation cases were relieved by the removal of the gall bladder. In 29 per cent. there was a history of mucus in the stools. Of these, 65.2 per cent. have been entirely relieved of their so-called "mucous colitis."

The x-ray gives but little help in arriving at a diagnosis, except in a negative sense. Even if gall stones are present, it is only in about 6 per cent. of cases that they are of sufficient density to cast a shadow. There is, however, a hypermotility of the stomach in about 65 per cent. of the cases of gall stones. Not infrequently when the gall bladder is distended it will cause pressure upon the duodenal gap, and this gives one some assistance.

From this study, from previous analyses of cases, and from animal experiments, one is convinced that inflammation of the gall bladder begins in early life. From observation at operation, I have become convinced that in some cases stones develop; in others there develops local or generalized liver cirrhosis, and in about 6.2 per cent. of others, chronic pancreatitis. When stones develop, and the gall bladder containing them is removed—providing they are not also present in the hepatic and common ducts—the result is as a rule satisfactory. If there are stones in the hepatic or common duct, these must also be removed and the common duct drained. Even then stones may recur. When liver cirrhosis has developed, one must be more or less guarded in the prognosis, as it is doubtful if this fibrosis can ever completely clear up, even when the cause has been removed. Hence such patients are prone to suffer from some digestive disturbance.

Now with reference to pancreatitis. Archibald has shown that the ampulla has a sphincter. We know an acute pancreatitis may occur as a result of an impacted stone in the ampulla of Vatter, but what is the explanation of a low grade pancreatitis in these chronic cholecystitis cases? Of course there must be some reason why the bile, in the absence of stone in the ampulla, finds its way into the pancreatic ducts. I know that *spasm of the neck of the gall bladder does occur*, for I once had my finger caught and held so tightly that to have withdrawn it would have meant tearing out the gall bladder and its duct. It was necessary to wait until the patient was deeply anæsthetized before I could release my finger. Is it not conceivable that *a spasm may occur simultaneously at the neck of the gall bladder and at the ampulla*, when the bile, with great force, would be driven up the pancreatic ducts?

If one has once seen acute hæmorrhagic pancreatitis, he will not readily mistake it on a future occasion. The vomiting, the acute suffering from violent epigastric pain, the cyanotic pallor, the appearance of shock, often unrelieved except by an anæsthetic, can rarely be confused with any other acute abdominal condition.

From this violent type of pancreatitis there must of course be all sorts of gradations, just as in any other type of inflammation, and these become more and more difficult to interpret as they lessen in severity.

The pain is epigastric and a little to the left of the mid-line; the patient can frequently put his finger upon the point of maximum pain. Rolph has pointed out as a sign of cholecystitis the frequency of a tender point "in the colon" above and to the left of the umbilicus, but then the colon is rarely to be found there. The tender point is over some part of the pancreas, and of course associated with it is the cholecystitis. One must guard against mistaking acute perforation of a viscus for an acutely inflamed pancreas.

If there have been repeated attacks and the pancreas is in a state of chronic inflammation, there frequently develops a pigmentation of the skin known as "hemochromatosis." There is also a loss of appetite, often nausea at the sight of food, with gastric discomfort coming on an hour or so after meals.

In addition to that and a history of frequent gall stone attacks, one has to depend largely upon functional diagnosis;for example, when the internal and external secretions are involved, there will be only a partial use of protein and fat, hence the carbohydrates absorbed go out as glucose in the urine. If the external secretion alone is affected, muscle fibre and fat appear in the stools, because the digestion of protein and fat is interfered with.

Some people lay stress on the use of Sahli's glucose test, and some on Schmidt's nucleus test. These are very elaborate and are so full of sources of error that by the time the case is fully diagnosed by our medical friends, the symptoms and signs may have become those of an *impending autopsy* rather than of a curable surgical condition.

When the upper abdomen is opened, there is such a close association from the developmental side between the stomach, pancreas, liver, gall bladder and ileo-cæcal region that one, if he is to do the best for his patient, must make a careful survey of the whole ground. One may often find a localized lobule in the pancreas. It is not sufficient to find a kinked appendix, or a thickened gall bladder, or a few gall stones, and deal with that only; but one must carefully inspect the pancreas and deal with it, or the other organs, as occasion may demand. More than once I have found it necessary to remove the appendix and the gall bladder, deal with a duodenal ulcer, and do a gastro-enterostomy, as well as drain the cystic duct.

By that I don't mean draining it to the outside, but into the duodenum. To my mind one of the most absurd procedures in surgery is the drainage of the gall bladder, because there is pathology in the pancreas due to *gall bladder* disease. If there is a pathological condition in the gall bladder, remove the bladder, but leave a small collar at the neck, and through this funnel pass a small catheter through the cystic duct to the common duct, and thence to the duodenum. If the cystic duct is fibrosed, then open the common and carry a small catheter into the duodenum. This will not only provide for free drainage of bile into the duodenum, but gives one a great opportunity for administering nourishment such as saline, glucose, or peptonized milk, directly into the upper intestines, as I suggested twenty years ago (1). If left in the duodenum long enough, the sphincter will be fixed, and the possibility of spasm very remote.

It has been demonstrated that if the pancreatic ducts are blocked, it is useless to try to transplant them into the bowel. There is no peritoneal covering, and they atrophy and slip out. In such a condition one must prepare an intestinal loop and make a block transplant of the head of the pancreas with its ducts.

One is often astonished at the results of treatment of pancreatitis. For instance, one patient who had had asthma for many years was freed of her abdominal condition, and entirely relieved of her asthma. Even in the cases in which the hemochromatosis has been a striking feature, one is gratified to find it gradually disappear.

In addition to the improving of the pancreatitis, some rather unusual symptoms were completely relieved by removal of the gall bladder, as for example, pain about the rectum, associated with mucus in the stools. In one case of rheumatism that also had mucus in the stools, the mucus condition was relieved, though the rheumatism is not entirely gone.

In the 1920 series, five died. One with pulmonary embolus ten days after operation; one with ruptured gall bladder, pancreatitis and peritonitis; one had associated acute pancreatitis; one developed an acute dilatation of the heart 18 hours after operation; one died from pure cussedness and a lack of will to recover. He had an associated callous duodenal ulcer, for which gastro-enterostomy was done.

In the 1920 series there were stones in 42 per cent. of the cases of chronic cholecystitis. This is rather more than the average in previous studies. There was one case of cancer of the gall bladder —and this would have been prevented had his "symptoms" been properly interpreted before the cancer developed. There were 6.2 per cent. chronic pancreatitis.

The department of pathology reports one normal gall bladder removed, but clinically it was thick-walled, with palpable glands along the duct, and adherent at the fundus to the duodenum. The symptoms have been entirely cleared up by the operative procedure, so that my conscience is clear.

To recapitulate, then:—

(1) Eliminate from vocabulary terms that have no pathological basis.

(2) Take an accurate history and interpret carefully.

(3) To make a diagnosis, don't wait for an atttack of gall stone colic, or of jaundice, for there may be cholecystitis long before either occur.

(4) Make a careful physical examination, looking for tenderness under the right costal margin, associated with tenderness over the 8th, 9th and 10th dorsal roots.

(5) In this way intelligent treatment may be instituted earlier, and the mortality statistics lowered, to say nothing of the fact that a healthy man is an asset to the community, as compared to one who is semi-invalid.

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(1)Canadian Journal of Medicine and Surgery, 1900.

THE OPERATIVE TREATMENT OF VESICO-VAGINAL FISTULÆ

A. C. Hendrick, M.A., M.B., F.R.C.S.

Toronto

Causation of fistulæ.

I.—Fistulæ of puerperal origin. These are important and the following are the more usual causes:

(*a*) Long-continued pressure of the presenting part in impacted labours. The pressure may bring about such lowering of the vitality of the parts concerned as to allow of infection and necrosis of the tissues.

The impaction may be due to:

1.—Pelvic contraction.

2.—Hydrocephalus.

3.—Impaction of the breech.

Contributory causes are:

1.—Neglect to empty the bladder and to keep it empty during labour.

2.—Too long delay in delivery—but even impaction of three or four hours may suffice to do sufficient damage.

(*b*) Faulty technique:

1.—Abuse of the use of the obstetric forceps either bruises or causes lacerations.

2.—Faulty use of certain instruments, *e.g.*, perforator or decapitating hook.

3.—Sharp points of the cranial bones after the operation of craniotomy.

(*c*) Obstetric operations:

1.—Vaginal cæsarean section.

2.—Symphysiotomy.

3.—Criminal abortions.

II. Fistulæ of Non-Puerperal Origin.

(*a*) Infective:

1.—In the later stage of malignant disease.

2.—From vesical calculi.

3.—Specific ulceration, *e.g.*, syphilis and tuberculosis.

4.—The pointing of an abscess.

(*b*) Accidental fistulæ:

1.—Wounds, *e.g.*, accidental.

2.—Foreign bodies in the vagina, *e.g.*, pessary.

3.—Procidentia uteri with cystocele and ulceration.

III. Post-operative fistulæ:

1.—After pan-hysterectomy, for carcinoma of the cervix.

2.—Palliative operations, *e.g.*, scraping or cauterizing for malignant diseases.

3.—Effects of radium.

The varieties of fistulæ, classified according to their position:

1.—Urethro-vaginal.

2.—Vesico-vaginal.

3.—Vesico-cervical.

4.—Uretero-vaginal.

5.—Uretero-cervical.

Anatomy of fistulæ:

It is important to review the anatomy of the regions concerned.

The vagina: The vagina is a dilatable membranous passage extending from the vestibulum vaginæ to the uterus, the neck of which is embraced by it.

It passes downwards and forwards, usually parallel to the plane of the pelvic inlet. The anterior and posterior walls are in contact. Its widest diameter is opposite the lateral fornices and measures 5 c.m.

The vagina reaches higher on the cervix behind. There are certain landmarks on the vaginal walls which are important. These are the columnæ rugarum.

The anterior columna extends from just above the hymen, about a third of the way up the anterior wall. This corrugated ridge—the carina urethralis vaginæ-marks the area of the anterior wall of the vagina which is in contact with the urethra, and is an important area to recognize. Behind this area, which is marked off by a well-defined transverse ridge, the anterior vaginal wall is smoother and more spread out and marks the area in contact with the trigone and the vase of the bladder.

A useful rule is that the lower third of the anterior vaginal wall, distinguished by the longitudinal and transverse rugæ or carina urethralis vaginæ, is in contact with the urethra and closely bound to it by the urethro-vaginal septum.

The middle third of the anterior wall of the vagina, which is smooother than the lower third, is in contact with the trigone of the bladder, but not so firmly attached as the region of the urethra or carina urethralis vaginæ.

The upper third of the anterior wall, almost one inch in length, is in contact with the base of the bladder above the trigone, by looser areolar tissues.

These facts—that the middle and upper third of the vaginal anterior wall are loosely attached to the bladder by areolar tissues—is taken advantage of in any stripping operation, *e.g.*, anterior colporraphy, or radical cure of cystocele as one always begins to do the separation at the upper portion of the vagina.

Relations of trigone of the bladder to anterior vaginal wall:

The trigone is about one inch on each of its three sides. The termination of the carina urethralis vaginæ on the lower third of the anterior vaginal wall marks the level of the urethral opening in the bladder.

An equilateral triangle with one apex at the urethral opening, and sides of one inch, would mark the openings of the ureters in the bladder.

But two other important facts are to be recalled: (a) The vagina has no sub-mucous coat, and its mucous membrane is firmly attached to the muscular coat; (b) the bladder has a sub-mucous coat between the muscular coat and the mucous membrane. This sub-mucosa of well-marked areolar tissues and very vascular is intimately connected with the mucous membrane, but loosely to the muscular layer of the bladder, except over the trigone area, where it is more firmly attached. Hence while there is no danger of stripping the mucous membrane from the muscular coat, in the case of the vaginal walls there is great danger of doing so in the case of the bladder, especially in the region of the base. Hence one must be careful to keep in the fascial plane and not strip the mucous membrane of the bladder from its muscular coat.

This anatomical fact in regard to the structure of the bladder wall explains why there is often prolapse of the mucous membrane of the bladder, through these vesico-vaginal fistulæ.

Relation of the ureters to the vagina:

The ureter is about 15 m.m. lateral to the cervix, crossed above by the uterine artery. It then passes near the lateral fornix of the vaginæ to reach the interval between the vagina and the bladder.

It reaches the anterior vaginal wall about on the level of the lower edge of the anterior lip of the os uteri, or about the junction of the upper third with the middle third of the anterior vaginal wall, and is adherent to the vaginal wall at the lateral fornix.

The ureters pass obliquely through the bladder wall lying beneath the mucous membrane for some part of their intramural course, which extends altogether for three-quarters of an inch.

The above are the usual relations of the ureters; certain variations in the course may occur, but this is not important since the ureters are always defined before operations by the passage of the ureteral catheter.

Operations for vesico-vaginal fistulæ:

1.– *Preliminary preparations.* Cystitis and vaginitis must be cured first.

2.– *Time to operate.* When the fistula is the result of an accident at delivery or operation

(Wertheim's), six weeks is the limit to wait. If the fistula does not close spontaneously in that time, operate.

3.—*Posture of patient.* (a) The exaggerated dorso-lithotomy position, or (b) Bozeman position

Methods of operating. There are many methods advocated, but a modified flap-splitting is the best and most useful.

Essentials to success in operation.

1.—Wide separation of the vaginal wall from the bladder wall, being careful, however, not to split the bladder mucous membrane from its muscular coat. This will not happen in the case of the vaginal wall, since it has no sub-mucosa.

2.—Define ureters by catheters passed in them.

3.—Use only plain catgut for the first line sutures, not silk.

4.—Be sure the bladder mucous membrane is not pouting into the suture line.

5.—Have a good projection into the interior of the bladder of the sutured tissue.

6.—Use round-bodied non-cutting needles.

Methods in flap-splitting:

1.—The first suture unites the mucous membrane by means of the Connell suture, or the method where the needle is entered on the mucous membrane surface, such as is used in the operation of gastro-enterostomy. The suture is plain catgut.

2.—The second suture in the mucous membrane is Cushing's suture of No. 1 chromic.

3.—The third suture closes the vaginal mucous membrane by continuous chromic suture.

A modified flap splitting.

When the fistula is situated high up in the vagina the following method is useful.

Make a circular incision, excentric to the fistula, about 7 m.m. to one side and 12 m.m. to the other, through the vaginal mucous membrane. Then dissect up this island of vaginal mucous membrane to within two or three m.m. of the edge of the fistula. A collarette is thus formed of vaginal mucous membranes, adherent to the fistula border by a circular pedicle.

This collarette is invaginated into the fistula opening by means of the stitches with the needle entering on the surface to be invaginated. Result —the vaginal mucous membrane comes to face the cavity of the bladder and its raw surface the vagina. Follow this with Cushing's suture of fine chromic gut, and then close the vaginal mucous membrane over this surface.

At the conclusion of the operation the vaginal suture lines are painted with iodine solution and the vagina lightly packed with gauze.

After-treatment.

1.—Patient kept in bed for two weeks.

2.—Catheter is passed every 3 or 4 hours, night and day, for one week.

3.—Urinary antiseptics are given.

4.—Plenty of fluids and light diet.

5.—Mild purgation and oil enema are employed to avoid strain.

Mortality in Placenta Prævia.— Kellogg (Boston Med. and Surg. Jour., October 13, 1921) summarizes the mortality in planta prævia for the last twenty-five years at the Boston Lying-in Hospital. By early and more prompt treatment and the resort to conservative methods of delivery by Braxton Hicks's version and the uses of the bag, to the exclusion of manual dilatation and extraction, the maternal mortality has been reduced from 20 per cent. to 6 per cent., there being 55 cases without maternal mortality, the fœtal mortality of 48 per cent. remaining practically the same as with less conservative methods. Though probably nothing can prevent death in cases reaching hospital pulseless and moribund, it is possible that some might be saved by packing the cervix and vagina, putting a waist tourniquet over the uterus, transfusing and combatting shock for several hours before attempting delivery Though theoretically Braxton Hicks's version is indicated in non-viable children and bags in viable, the results for the latter have been as good with Braxton Hicks's version as with bags, and this is the method of choice in rural districts. Pituitrin is valuable in marginal varieties where there is a floating head with inadequate pains, by producing enough contraction to force the head down and so control bleeding, as happened in two instances which then delivered themselves normally.

CIRCUMSCRIBED SYPHILITIC ULCER OF THE STOMACH: REPORT OF A CASE*

George B. Eusterman, M.D.

Section on Gastro-Enterology, Mayo Clinic, Rochester, Minnesota

THE last of my three previous articles on the subject of gastric syphilis contained a summary of observations and conclusions based on a series of fifty-five cases. Since that time ten more cases have been added to the list. The case in this report represents an unusual type. A careful study of the material mentioned disclosed outstanding characteristics as follows:

1.—Organic gastric syphilis is rare even in advanced stages of systemic syphilis. The average age incidence is between thirty-five and forty years, the average duration of symptoms about two years, and the average duration of the infection about twelve years. In contrast, the average age of the patients with chronic benign calloused ulcer is forty-five years, with symptoms on an average of from nine to ten years; the patient with cancer averages fifty-four years, with symptoms of two and one-half years' duration. Exclusive of the patients with heredosyphilis and the advanced obstructing hour-glass types, cachexia is rare, anæmia is not marked, and invariably, a gastric tumour is not palpable.

2.—There is no symptomatology characteristic of the lesion, and variations in the clinical picture depend largely on the site and extent of the involvement. Localized involvement of the pylorus with or without stenosis and with free hydrochloric acid and enzymes in the gastric secretion may simulate benign pyloric ulcer; in obstructing hour-glass conditions the patients usually have considerable pain, and vomiting soon after taking food; in the contracted and deformed types there is distress, pain, and symptoms in proportion to the nature and amount of the food taken. The symptoms in the main closely approach those characteristic of a slowly progressive form of scirrhous carcinoma. The symptoms common to all the cases were a fairly marked progressive course, pain soon after eating invariably associated with nausea and vomiting, absence of hæmorrhage, maintenance of appetite in the majority of cases, and marked loss of weight without definite cachexia. Achylia was present in more than 80 per cent. of the cases; in 20 per cent. there was free hydrochloric acid in the gastric extract, but usually with subnormal values. In 7.5 per cent. of the latter achylia alternated with free hydrochloric acid secretion.

3.—The pathologic anatomic process in all the cases was a progressive inflammatory one, rarely circumscribed, and involved the lower and middle thirds of the stomach in the majority of cases, with extension upward along the lesser curvature. Hour-glass contractures usually involved the pars media. General diffuse syphilitic cirrhosis was characteristic of the congenital cases. In advanced cases hour-glass contraction, marked thickening, deformity, and contracture due to fibrosis was the rule.

4.—In from 50 to 60 per cent. of all cases of proved gastric carcinoma a tumour is palpable, in contrast to 15 per cent. of the syphilitic cases. Of proved cases of gastric carcinoma in all stages, free hydrochloric acid is found in 46 per cent., but it is absent in 80 per cent. of all cases of gastric syphilis.

5.—Carman states that although the roentgen signs of gastric syphilis are not distinctive and pathognomonic in every case, they furnish decisive evidence of gastric involvement and in correlation with the clinical and laboratory findings give indispensable aid in the diagnosis of this disease. In his judgment the roentgenologic signs of gastric syphilis are: (a) filling defect of the gastric outline, usually without corresponding palpable mass, (b) hour-glass stomach—dumb-bell—or the upper loculus expanded and bulbous, and the lower loculus tubular, due to extensive irregular concentric contraction, (c) six-hour retention less frequent than in other gastric lesions (about 20 per cent.); (d) diminution of gastric capacity; (e) stiffening or lessened pliability of the gastric wall; (f) absence of peristalsis from the involved area;

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*Presented before the Western Ontario Academy of Medicine, London, Ontario, May, 1921.

(g) pylorus free rather than obstructed; (h) patient usually under cancer age and not ill in proportion to the extent of the disease shown by the roentgen ray, and (i) absence of a niche, accessory pocket, or typical incisura, classic signs of simple gastric ulcer.

6.—Intensive syphilitic treatment in the early stages may produce actual clinical and anatomic cure. In advanced cases there may be little or no response. In the series of fifty-five cases previously reported a clinical cure was shown in 42 per cent. and improvement in 50 per cent., representing a total of 92 per cent. improved or cured. This includes twelve cases (30 per cent.) in which anatomic restitution to normal was complete or nearly complete.

7.—The proof of the specificity of a lesion involves numerous factors. The requisites are: demonstrable evidence of a gastric lesion, positive Wassermann reaction or other reliable evidence of syphilis elsewhere in the body, or both, and definite, sustained therapeutic improvement. These factors in conjunction with achylia or subacidity in the majority of cases, with the roentgenologic characteristics herein described, in addition to the anatomic improvement or cure, seem to make the clinical or *intra vitam* diagnosis of syphilis of the stomach conclusive. The following is the composite picture of acquired gastric syphilis:

The patient is usually a male adult whose average age is thirty-five years. His gastric disturbance has been, on the average, of a little more than two years' duration, and characterized chiefly by pain, vomiting, and flatulency, coming on fairly promptly after meals. Little or no relief is experienced by ordinary methods of management. The clinical course is progressive. Gastric chemism and roentgen findings strongly suggest cancer. The patient is under-nourished, but not cachetic, may be somewhat anaemic, and usually an epigastric mass is not palpable. The gastric lesion is invariably extensive, occasionally localized in the pyloric area, with only a slight tendency to produce stenosis. Such characteristics in conjunction with a positive Wassermann reaction, or with a history of infection and other clinical signs of syphilis, are strong presumptive evidence of specific gastric disease.

REPORT OF CASE

Case 301018—Mr. W. H. H., aged 46, farmer, was examined in the Clinic January 23, 1920. He had had gonorrhea in 1895, malaria in 1898, syphilis in 1900, rheumatic fever in 1903, and influenza in 1918. A local physician treated the primary lesion with calomel powder and it disappeared in a few days. The patient had no knowledge of skin or mucous membrane secondaries, alopecia, and so forth. About one year afterward he had paralysis of the left side of the face which lasted six months, associated with "sore throat" for about one week at the outset. Potassium iodide was prescribed and taken for one and one-half years without untoward gastric symptoms. The patient had married in 1905. Two years after marriage, his wife had abortion induced (?) at two and one-half months. There were no further pregnancies and no precautionary measures were taken. The wife was given a divorce by publication eight years after marriage.

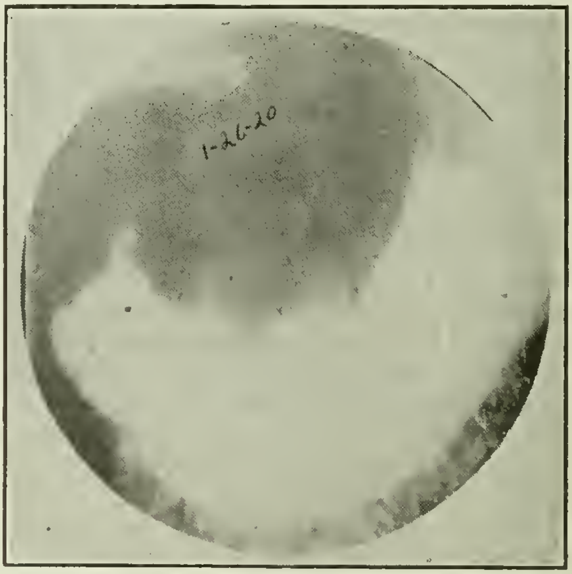

FIG. 1.—Case 301018—Roentgenogram January 26, 1920. Gastric ulcer on the posterior wall of the body of the stomach, No. 2 retention; niche of the ulcer was not seen in the roentgenogram. A diagnosis was made on the fluoroscopic findings.

The patient had not had gastro-intestinal disturbances prior to October, 1919. At this time symptoms developed gradually but became quite marked within six weeks. He complained chiefly of distress, sometimes a severe pain, chiefly localized to the anterior lower portion of the chest. This distress or pain usually appeared about thirty minutes after meals and was associated with belching, never with actual nausea or vomiting. His appetite failed from the outset, and he was apprehensive on account of the proximity of the pains to the precordium. The pains were never epigastric. On occasions he regurgitated his partially digested breakfast at 6.00 p.m. with con-

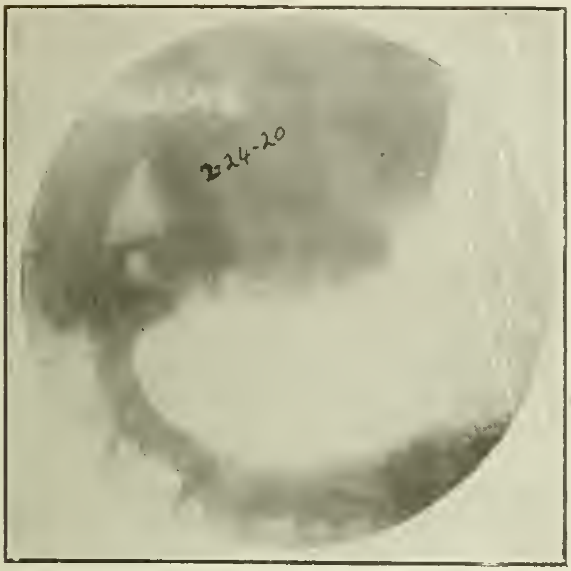

Fig. 2.—Case 304048—Roentgenogram February 24, 1920. Findings the same as in the roentgenogram in Fig. 1 except that the retention was No. 1.

siderable relief from subjective discomfort. Large meals were especially disturbing, and he voluntarily restricted his diet as much from fear of postprandial discomfort as from a lessened appetite. November 15, 1919, he discontinued work because of the pain and weakness. His dyspepsia persisted and was actually progressive in spite of a markedly restricted diet, chiefly consisting of toast, milk, and raw eggs. There were no nocturnal pains. The bowels were quite regular as a rule. At regular intervals after meals the patient had pyrosis or salivation. He lost 17 pounds in weight. During the three weeks prior to coming under our observation he lived chiefly on milk toast.

Physical examination revealed considerable dental repair, chronic tonsillitis, irregular pupils but good reactions, cervical and axillary adenitis, tenderness high in the middle line of the epigastrium, a left inguinal hernia, a few external hæmorrhoids, and moderate prostatic hypertrophy. Urinalysis, blood pressure, thoracic organs, and superficial and deep reflexes were objectively negative. The veins of the fundus of the eye were full and tortuous. Fractional gastric analysis revealed a slightly subnormal acid curve and a tendency to moderate hypersecretion. Pathologic elements were not found on chemical or microscopic examination. A Wassermann test on the blood serum showed total inhibition of hæmolysis. Roentgenograms January 26, 1920, demonstrated a No. 2 six-hour barium retention. The niche of the ulcer which was on the posterior wall of the stomach was not seen, but was diagnosed on fluoroscopic findings.

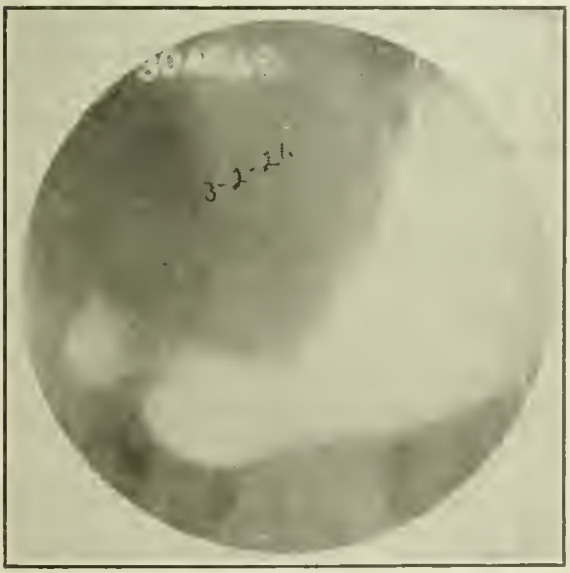

Fig. 3.—Case 304048—The roentgen examination March 2, 1921, was negative. Both at the second and third examinations it was noticed that the stomach had diminished in size.

Following medical and surgical consultation in which the possibility of a benign, malignant or syphilitic ulcer was under serious consideration, it was decided to institute intensive treatment for syphilis; in the event of unsatisfactory response surgical interference would be reconsidered. Between January 31, 1920, and March 6, 1920, the patient received six intravenous treatments of arsphenamine under the direction of Dr. Stokes and his associates. The patient later stated that on the sixth day after the first injection all his gastric symptoms disappeared, and that he had gained 28 pounds, an average of one pound each day. February 24, 1920, a second roentgen examination showed that the niche had become considerably smaller, and the six-hour retention was less. March 1, 1921, the patient returned at our request for another examination. In the meantime he had had forty mercurial inunctions self-administered. His health had been excellent since his first visit; his weight was 141 pounds. Gastric analysis revealed normal acid values and good motility. *X*-ray of the stomach March 2 and March 5, 1921, by Dr. Carman, revealed normal conditions, but the Wassermann reaction was again strongly positive. (Figs. 1, 2 and 3). A second course of six intravenous arsphenamine treatments was given between March 7 and April 11, 1921

Discussion

Gummatous tumour and round ulcer, until recently, have been the popular pathologic conceptions of gastric syphilis. Before the era of serology and roentgenology the clinical diagnosis of syphilitic round ulcer of the stomach was frequently made, and such well-known observers as Ewald, Fenwick, and Neumann were authority for the statement that from 5 to 20 per cent. of their cases of chronic ulcer were syphilitic. Other writers, however, would not subscribe to such a high percentage, and, on the basis of pathologic studies by Chiari, Fraenkel, and others since then, the earlier percentages were unquestionably too high. That gumma or gummatous tumour, which was practically the only anatomic lesion of syphilis recognizable by the early pathologic anatomists, is the usual type of lesion of later or latent syphilis is apparently disproved by Warthin's exhaustive investigations. He is firmly of the opinion that the viscera are involved in all cases of latent syphilis, not by gummatous processes, but by specific inflammatory processes, eventually fibrosis, usually mild in character, but acquiring pathologic importance because of this progressive character. To the clinician a proper conception of the pathologic process is of immediate diagnostic and practical importance. The coincidence of chronic ulcer of the stomach and duodenum, of gastric ulcer, and systemic syphilis is not uncommon. It has been my unfailing experience in the gastric or duodenal ulcers which exhibit chronicity and hyperacidity, and which have symptoms controllable by diet and alkalies, that the associated systemic syphilis, latent or active, has no etiologic relationship. This experience is further fortified by the fact that urgent treatment for syphilis has no influence on the symptoms or structure of the ulcer and that histologic examinations of the lesions removed at operation are characteristic of benign callous ulcer. The symptomatology and rapid clinical course of the case herein reported was not unlike that of many other proved cases of gastric syphilis; it differed only in that the pathologic process was circumscribed.

Our clinical experience, combined with the evidence obtained at the operating table and in the fluoroscopic room supports the modern conception of pathologic processes in the viscera of patients with old or latent syphilis. A circumscribed gummatous tumour (syphiloma, syphilitic gumma, and so forth) which is palpable and which, if at the orifices, may even produce obstruction, is rare in our experience. The roentgenologist has shown that this type of lesion is either rare or gives little or no distress because the majority of cases in which roentgen-ray examination is made are not of this type. For "in lues notwithstanding the extensive distortion of the stomach, no corresponding mass can be felt, and the filling-defects are evidently due not to the intrusion of a tumour, but to an infiltration and contraction of the gastric walls." (2). Warthin noted that the fibrosis in the tissues was very marked and associated with it were infiltration, ulceration, and cicatrization in varying degrees. Syphilitic round ulcer is probably the result either of a peripheral endarteritis or of the ulceration of a single gummatous lesion in the submucosa. These must be clearly distinguished from the more frequent, shallow, dirty, multiple ulcerations of the gastric mucous membrane over an inflammatory syphilitic process in the submucosa. Wile, in a fairly complete article dealing largely with a review of the literature on gastric syphilis, mentions a recent case of syphilitic gastric ulcer in Cabot's service at the University Hospital, Ann Arbor. The patient gave a negative Wassermann reaction, but Warthin was able to demonstrate spirochetes in the excised material.

This is our first convincing case among several thousand cases of benign ulcer of a circumscribed single deep syphilitic ulceration of the stomach. Undoubtedly the true nature of other gastric ulcers has been overlooked, but we are convinced that this type is fairly rare.

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VAGINO-VESICAL AND UTERO-VESICAL FISTULÆ—OPERATIVE TREATMENT*

David W. MacKenzie, M.D.

From Department of Urology, Royal Victoria Hospital, Montreal

URINARY fistulæ bring about a condition which makes the patient truly miserable and become a source of great worry to all thinking genito-urinary surgeons. It may be due to extrophy of the bladder, to transplantation of ureters in the skin, to traumatic sinus from the ureter to the vagina or to traumatic utero-vesical, vagino-vesical or urethro-vaginal openings.

This paper will deal with what we consider a few important points in the operative treatment of utero-vesical vagino-vesical, and urethro-vaginal fistulæ by the perineal route. We do not claim originality in any way. We will simply describe in detail the methods employed on our service for the closing of the fistulæ between the bladder and the vagina or the cervix or both. Such fistulæ are the result of difficult parturition, colpotomy wounds, abdominal operations and more particularly hysterectomy, radium or cautery treatment for cancer.

In general, obstetric management and operative treatment have both greatly improved in later years, but from the records in the majority of the large clinics in America and in Europe there is abundant evidence that we still have such fistulæ to combat. During the past three years in our own clinic we have had from almost every section of the United States and Canada patients suffering from this condition; and that the technique still calls for some further details is proved by the histories of from one to eighteen operations on the same patient. In a long series from the Mayo Clinic, Judd reports patients who had six and seven previous operations. One of our patients with a high vesico-vaginal fistula had undergone seven operations, another twelve operations. One woman with complete loss of the floor of the bladder from cervix to urethra inclusive, had eighteen operations before coming to our service.

That the best method of operation is still undecided is deduced from the arguments of many prominent surgeons. Trendelenburg, Marcy, Legueu and others claim advantages for the transperitoneal route; Paris, Francey and others from the transvesical route; Seulze-Berge advocates operation through the pre-vesical space; Bachrach upholds the transplantation of the ureters in the skin. Several surgeons believe in the transplantation of the ureters in the bowel; N ghoff and Mayo argue the superiority of the purse-string suture with traction to the bladder; Latzko, Rosenski, Bertino, Ferroni, MacLean, Ward, Judd and Kelly support many different varieties of the vaginal route. For suture material some use silk, some catgut, some silk worm gut and some silver wire.

The supra-pubic operation is as a general rule more suitable for uretero-vaginal fistulæ, but even at its best, for vesico-vaginal and vesico-cervical, it is more severe and it has a much higher mortality than when these conditions are approached from below. To Trendelenburg is due the credit for first using the supra-pubic operation for the cure of these fistulæ. His work was published in 1890. In 1902, Kelly advocated the employment of the knee-chest posture in order to obtain a good exposure of the vaginal vault. He opened the peritoneal cavity by a wide transverse incision. Eleven years later he contended that the lithotomy position was superior to the knee-chest posture.

The method to be employed in each case must of course be determined by a careful consideration of the conditions present and by the experience of the operating surgeon. In some cases, mainly those associated with the ureter, the supra-pubic is the only choice, but in all others the vaginal route should be tried first.

The apparent ease with which these fistulæ may be closed is too often very deceiving to the inexperienced, and unless definite procedures are followed, the results are often very unsatisfactory.

Before any operative procedure is undertaken the ureteral openings and the opening of the fistula in the bladder should be definitely located. If the opening is very small and free of the ureters, the high-frequency current may be tried. All possible facts regarding the course and position of the sinus should be ascertained before treatment is considered. An effort should also be made to get the tissues in the best possible condition for healing; this latter often requires considerable time as the mucous membrane of the vagina, bladder and labia may be much excoriated, infected, and coated with deposits of urinary salts.

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*Paper read at the American Association of Genito-Urinary Surgeons, Richmond, Va., May 2, 1921.

One of the greatest difficulties encountered is trauma to the vesical neck with partial or complete loss of the vesical sphinctor. If the opening of the bladder is high in the vaginal fornix, and especially if there is much scar tissue, it is sometimes difficult to obtain sufficient exposure for satisfactory dissection. This consideration led us to make two free lateral incisions in the perineum, lateral episiotomy wounds, with the same objective as Ward had with his paravaginal incision. It is surprising to what extent this will facilitate the bringing of the cervix and the fornix in full exposure in the operative field. With catheters in the ureters and a catheter through the fistula from the bladder to the vagina as guides, it is much safer to proceed with the dissecting of the vaginal from the bladder wall. Grasping the cervix with a tenaculum, we have used a long incision antero-posteriorly, in the vaginal vault surrounding the sinus, as in Fig. 1.

The vagina is now freely dissected from the bladder wall until the bladder hangs loosely and can be easily invaginated into that viscus. Unless this dissection is thoroughly carried out the possibility of cure is remote. With a small curved needle and a moderately fine catgut the sinus is invaginated into the bladder with interrupted sutures, or, if the fistula is small, with a purse-string suture. These are further reinforced by one or more lines of Lembert sutures. The vaginal wall is then loosely sutured over this with fine catgut. If the sinus is in the sulous at the cervix, the denuded cervix may be used to make body for our suture; if the urethra has been torn, it is well to dissect free the both sides, and, if possible, to grasp some of the sphinctor fibres or the scar tissue to which these are attached and to suture one side or the other to get a central body to give control. It is obvious that the bladder flaps should be free and loose and easily approximated in order that no tension may be exerted on the suture. We have used plain catgut entirely in these cases. We believe that the sloughing of the flaps or about the wound is too often due to tension on the sutures. The lateral perineal incisions are now sutured and the vagina is carefully packed with iodoform gauze to obliterate any dead space between the vagina and the bladder wall and also to elevate the floor of the bladder in order to bring the line of suture, if possible, to the ridge of a watershed.

The post-operative care is most important. A little carelessness at this point may destroy all hopes of final success. Following the operation, we have emptied the bladder, by means of a retention catheter or frequent catheterization. One of our patients urinated spontaneously after the second day without any undesired effect. All our patients were kept in bed for a period of from two weeks to eighteen days after the operation. There is no mortality in the series and the results were according to the tables:

TABLE I.

Type of Urinary Fistulæ operated on from November, 1917, to November, 1920.

Complete laceration from cervix through urethra	2
Vesico-vaginal	3
Vesico-cervical	2
Uretero-vaginal	2
Vesico-urethro-vaginal (multiple openings)	1
Urethro-vaginal	2
Recto-vesical vaginal	1
Total	13
Age of youngest patient	16 years
Age of oldest patient:	
Vesico-vaginal	51 years
Uretero-vaginal	53 years

TABLE II.

Extent of Involvement

Complete from cervix through urethra	2
Multiple sinus with absolute loss of urethra	1
Partial loss of bladder sphincter (no control)	2
Single sinus (vesico-vaginal and vesico-cervical)	5
Single sinus (uretero-vaginal)	2
Recto-vesico-vaginal	1

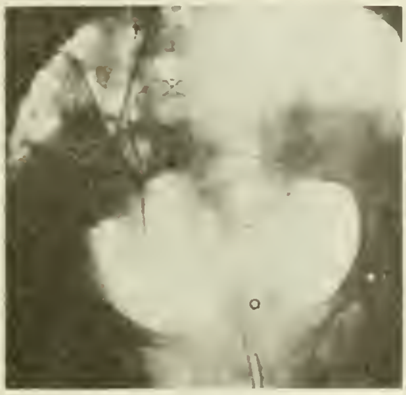

FIG. 1.—Case 2
X.—Ureteral catheter making complete circle.
O.—Vesico-vaginal fistula with catheter from bladder to vagina.

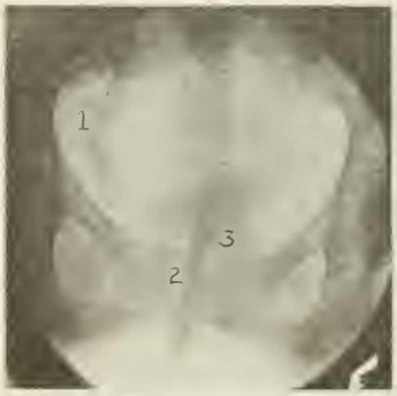

FIG. 2.—Case 4
1.—Dilated Ureter.
2.—Vesico-vaginal fistula
3.—Distorted bladder.

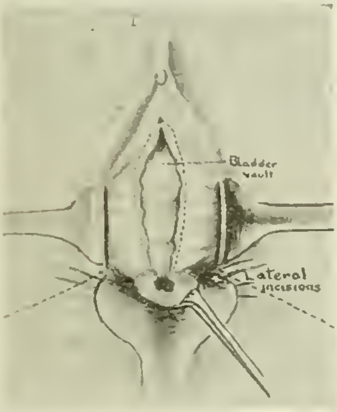

FIG.3.—Case 3
Complete laceration from urinary meatus to cervical canal.

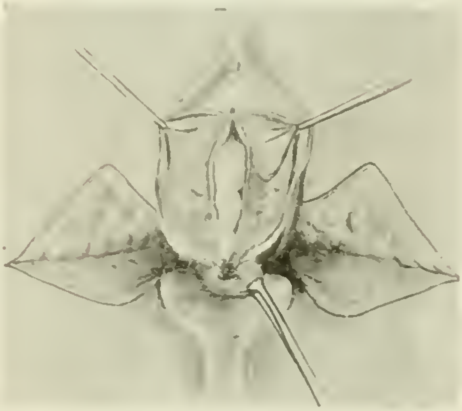

FIG. 4.—Case 3

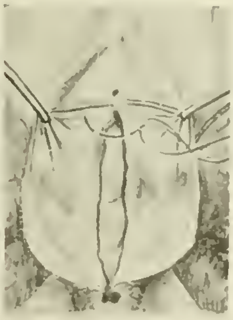

FIG. 5.—Case 3

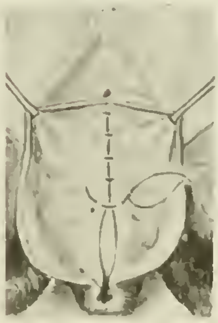

FIG. 6.—Case 3

Table III.

Etiology

Childbirth—Spontaneous	1
Childbirth—Instrumental	6
Appendicectomy	1
Colpotomy	1
Hysterectomy	3

Table IV.

Operations elsewhere

Three patients had had one operation.
One patient had had 18 operations.
One patient had had 7 operations.
One patient had had 12 operations.

Table V.

Patients operated on in our service.

Nine patients had one operation.
Three patients had 2 operations.

Table VI.

Results

Vesico-vaginal	cured
Complete laceration cervic through urethra	cured 2
Vesico-cervical	cured 1
Vesico-cervical	improved 1
Vesico-urethra-vaginal—two attempts for control—improved 1; (slight leakage on walking).	
Urethro-vaginal	cured 2
Recto-vesico-vaginal	not treated

Case No. 1: L. S., age 51, married. Admitted September 17, 1917, complaining of leakage of urine through vagina for 3 years following operation by vagina for a pelvic abscess. Seven previous operations. Cystoscopy: Showed a large sinus just internal to right ureteral orifice. Ureteral catheter easily passes through this into vagina. Vaginal examination shows a dimple with much scar tissue about it just to right of cervix in vault of vagina.. Operation: Catheters in position. Liberating lateral perineal incisions. Longitudinal incision in vaginal wall, extending down to right of cervix. Enclosing sinus. Vaginal wall well freed from bladder wall and closed with interrupted sutures, reinforced with two layers of Lembert catgut No. 1. Lateral perineal incisions also closed with catgut suture. Discharged October 23, 1917. Result: Cured. Out of hospital 25 days after operation.

Case No. II.: E. S., age 42, married. Admitted October 28, 1917, complaining of urinary leakage through vagina for 3 years. Had 12 operations for relief. Cystoscopy: External genitals irritated. Bladder small content. Right ureteral orifice normal. Left ureteral orifice is just below a large opening to the vagina, in scar surrounding this fistulæ. Unable to pass catheter up left ureter. Catheter through fistulæ passes into vagina at vault on the left just below line of suture of old hysterectomy wound. Urinalysis: Turbid. acid, 1026, albumin a trace, sugar 0.; Micros. pus:—, bacilli. Operation: (plastic) Lateral vaginal incisions. Dense scar about vagina openings. Vaginal mucosa freed from bladder. Sinus wall invaginated into bladder., vaginal wall sutured over this. Rest as usual. Discharged December 4, 1917.

Case III.: J. S., age 16, single. Admitted December 29, 1919. Complaints: Incontinence of urine for 6 weeks following instrumental delivery. Genito-urinary system: Linear slit easily admitting 3 fingers and extends from cervix uteri to urethra. Vault of bladder prolapses through opening. Operation: Liberating incisions, dissection. Vagina freed—interrupted Lembert sutures, several layers over each other. Discharged February 14, 1920. Result: Complete recovery.

Case No. IV.: B. C., age 32, single Admitted July 3, 1919. Complaints: Incontinence—June, 1908, appendix removed; July, 1908, search for sponge, no sponge found; April, 1909, right kidney removed, incontinence followed. Findings: Urethra normal, excellent control. Cystoscopy: Bands of adhesions separating bladder into two cavities. Small sinus to right leading to vagina to right and anterior of cervix. Diverticulum of bladder (catheter coiled) probably traumatic. First operation: Lithotomy; catheter in left ureter; probe through sinus liberating incisions. Incision: Vaginal wall freed from bladder and separated. Sutured. Vaginal packing. Slight leakage from tenth day. Three months later second similar operation successful. Result: Cured.

Case No. V.: M. K., age 35, married. Admitted August 9, 1920; discharged September 5, 1920. Complaints: incontinence of urine, following severe instrumental labour for 10 weeks. Has had 5 full-term labours with 3 instrumental deliveries. Vaginal examination shows extensive old laceration cervix, especially on left. Cysto-

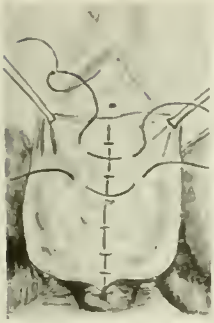

Fig. 7.—Case 3

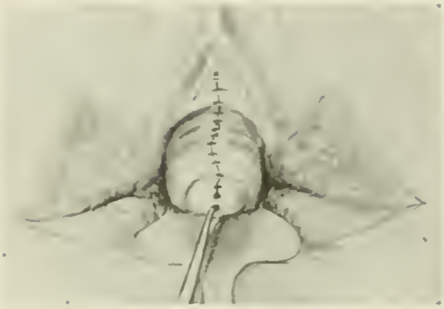

Fig. 8.—Case 3

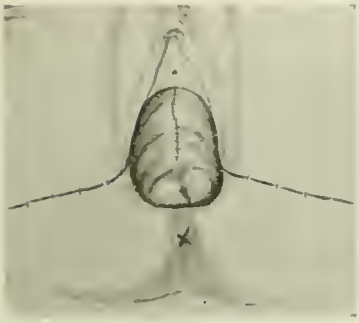

Fig. 9.—Case 3

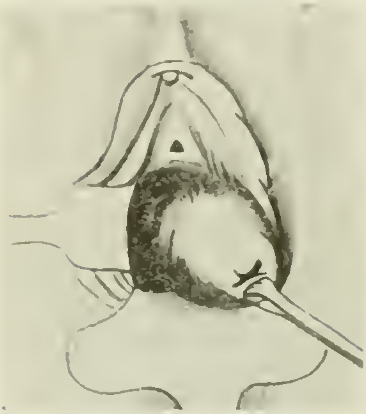

Fig. 10.—Case 1

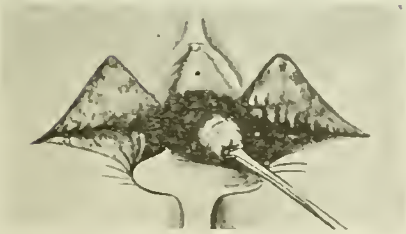

Fig. 11.—Case 1

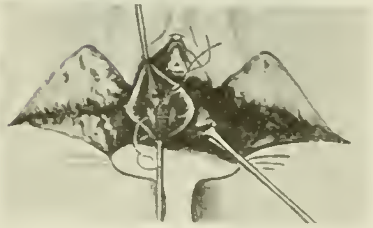

Fig. 12.—Case 1

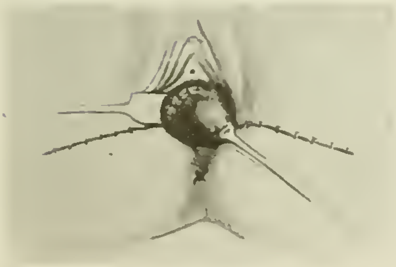

Fig. 13.—Case 1

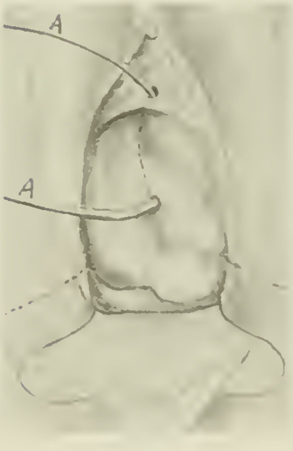

Fig. 14.—Case 5
Utero-vesical fistula.

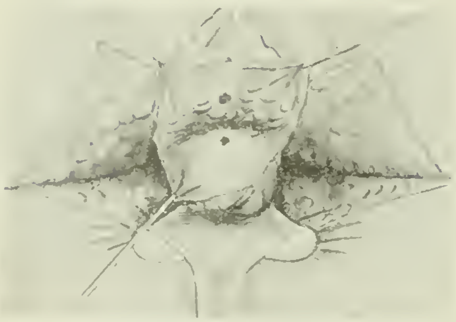

FIG. 15.—Case 5

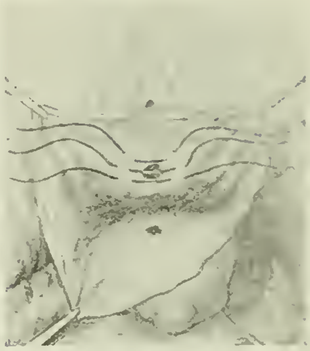

FIG. 16.—Case 5

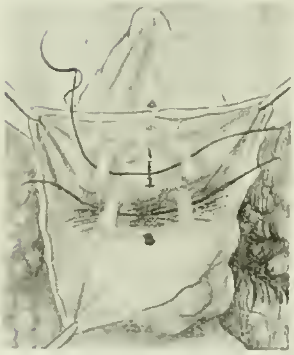

FIG. 17.—Case 5

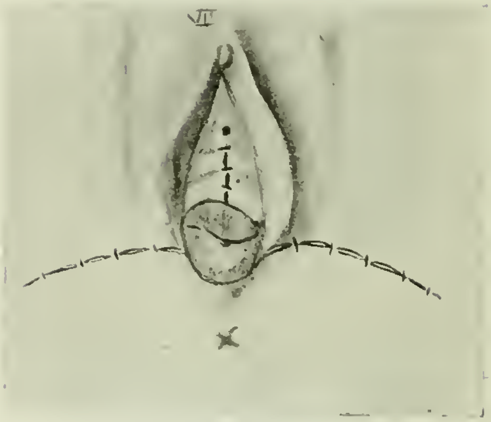

FIG. 18.—Case 5

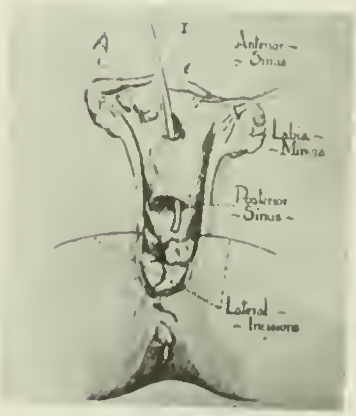

FIG. 19.—Case 6
Absolute loss of urethra with multiple fistulae and much scar.

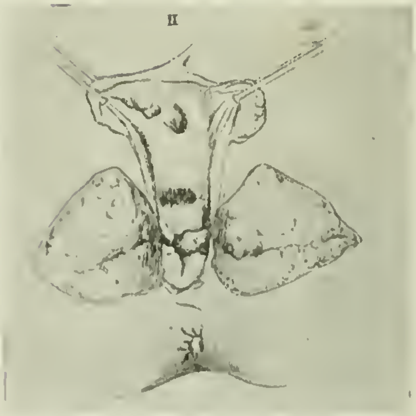

FIG. 20.—Case 6

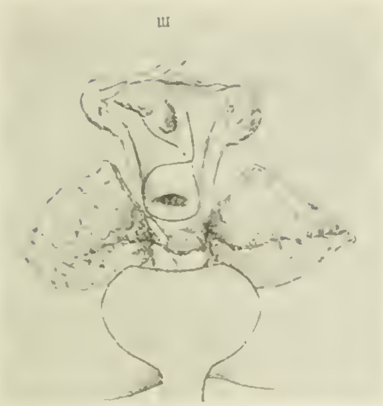

Fig. 21.—Case 6

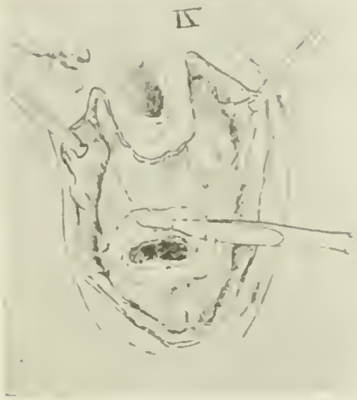

Fig. 22.—Case 6

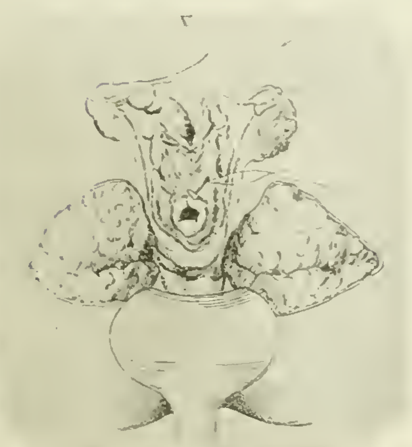

Fig. 23.—Case 6

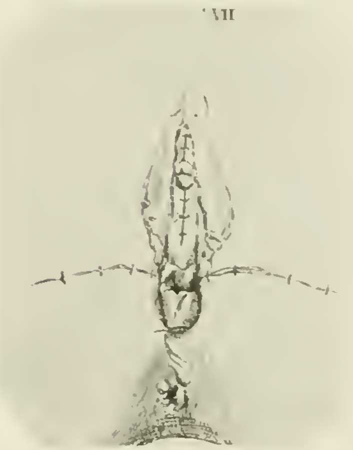

Fig. 24.—Case 6

scopy: Instrument easily introduced. Ureteral orifices: Left normal in contour and position; Right normal in contour drawn upwards. Scar, in centre of which is a fistula one-half inch from ureteral orifice. Catheter in fistula comes through cervix into vagina. Urine: Pale, cloudy, acid, 1012, albumin and sugar 0.; micros. pus:—, epithelium, bacteria. Phenolsulphonephthalein Test: 1st hour 21 per cent., 2nd hour 12 per cent., total 33 per cent. Culture of bladder urine shows B. Coli-communis. August 16th, operation for utero-vesical fistula. Result: Cured; discharged 20 days after operation.

Case No. VI.: M. C., age 30, married. Admitted September 1, 1920. Complaints: Constant dribbling of urine from vagina for three years, following instrumental delivery severe laceration; 18 operative attempts unsuccessful. Funnel pelvis. Cystoscopy: No evidence of a urethra; instead to patient's left is a gaping opening, will admit index finger. About 1½ inches posterior to this in left of vagina is another large opening admitting index finger to bladder. Right ureteral orifice slightly external to posterior opening. Left orifice ¼ inch above and included in the scar tissue about opening. Operation—plastic—successful in closing sinuses, but no control.

Case No. VIII.. E. C., age 37, widow. Admitted February 24, 1919; discharged March 30, 1919. Complaints: Inability to retain urine for one year. Symptoms: Lacks control of urine when walking, coughing and sneezing; frequency of urination; urgency. August, 1918, perineal repair, symptoms relieved for two months. Five children, no instrumental deliveries. Cystoscopy: Marked cystocele, scarred gaping urethra; otherwise normal. Operation: Vertical incision from just behind meatus for 4 inches. Vaginal wall separated from floor of bladder for 3 inches. Lembert sutures. Vaginal packing. Result: Cured.

Case No. IX.: J. McM., age 41, married. Admitted August 2, 1918, discharged August 6, 1918 Complaints: Frequency of urination. Blood and fæces in urine. Onset, May, 1918. Symptoms: Operation March, 1918, for ovarian trouble; May, 1918, frequency with fæces in urine. Cystoscopy: Malignant growth right side of bladder from base to vault. In centre of ulceration, slightly more to patient's left is sinus through which fæces passes. Recto-vesical fistulæ. Carcinoma of bladder, vagina and rectum. Result: nil—no treatment.

Case No. X.: M. E. S., married. Admitted February 18, 1919, discharged March 18, 1919. Complaints: Leakage of urine into vagina for 8 months. Symptoms: Following forceps delivery urine came away through vagina. Operation November, 1918—no result. Has had 8 children, last one by forceps. Cystoscopy: Perineal laceration. Rectocele. Vesico-vaginal fistula admits 2 fingers; extends from cervix uteri into urethra and towards patient's right. Roof of bladder prolapses through. Operation: Liberating incisions. Difficult separation vaginal wall from vesical. Much scar. Bladder and urethra closed by Lembert. Closure as usual. Result: Cured.

Case No. XI.: E. M., age 35, married. Admitted February 14, 1918. Complaints: inability to hold urine for 5 years. Symptoms: Incontinence of urine immediately following instrumental delivery. Later hysterectomy. Constant dribbling of urine. One previous operation unsuccessful. Cystoscopy: Bladder much contracted. Floor pulled upwards. Large opening upper portion of floor of bladder to left of left ureteral orifice which is in scar of fistulæ. Vaginal end of fistulæ in cervix uteri. Operation: Liberating incisions. Sinus in dense scar high up. Carefully freed—good flap to right. Poor to left. Lembert sutures; closure as usual. Result: Improved.

In conclusion, I wish to emphasize a few points considered of vital importance. These are:

1. Pre-operative cleansing of the parts.
2. Attacking the condition from a urological point of view.
3. Definite diagnosis with location of openings in the bladder and the relation to the ureteral orifices.
4. Lateral perineal incisions, especially for fistulæ high in the vagina or uterus.
5. Free separation of the vaginal from the vesical wall.
6. Multiple layers of suture with invagination of the bladder into that viscus.
7. Vaginal packing to elevate and support the suture line.
8. Post-operative judgment and care.

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The Therapeutic Properties of Propyl Alcohol.—Recent investigations by Christiansen (Ugeskrift for Laeger, October 13, 1921) into the therapeutic properties of propyl alcohol seem to suggest that, at any rate in certain diseases of the skin, this drug deserves wider popularity than it has hitherto enjoyed. In 43 cases of acne of the face, complicated in most cases by severe seborrhœa and stamped with a long record of failure to react to other remedies, excellent results were obtained. The treatment was continued for several months, and the patients found it easy to continue indefinitely the use of a 35 per cent. solution with which the face was bathed two or three times a day. In this strength the alcohol possesses no dehydrating properties and is non-irritating. In simple seborrhœa a 50 per cent. solution can be used. The author records several failures in the treatment of eczema, rosacea, psoriasis, diphtheria, and gonorrhœa, and, as a remedy for lice, propyl alcohol proved disappointing. But it was remarkably effective in prurigo, pityriasis and seborrhœa of the head, and as a hair wash a 35 per cent. solution of propyl alcohol with a little castor oil was found to be a very effective cleansing agent. Another and quite different sphere of usefulness was found for propyl alcohol as a preservative and disinfectant of surgical instruments. Provided a 50 per cent. solution is made alkaline by the addition of a little soda, instruments do not rust in it. As a disinfectant propyl alcohol is in every respect superior to ethyl alcohol, 5 per cent. of the latter corresponding to 2 per cent. of the former. A 50 per cent. solution of propyl alcohol can be obtained in Denmark from Germany at the cost of about 1½ crowns (about 1s. 6d.) for a kilo, and it is, therefore, cheap enough to be extensively used as a disinfectant of the hands and field of operation.—Brit. Med. Jour., December 10, 1921.

PREGNANCY AND TUBERCULOSIS*

David A. Stewart, B.A., M.D.

Medical Superintendent Manitoba Sanatorium, Ninette; Assistant Professor of Medicine, Manitoba University.

Part 2.—The Treatment of Tuberculosis Complicated by Pregnancy.

WHEN pregnancy has, through ignorance of the law, or of conditions, or in defiance of them, or on wrong advice, or against advice, actually begun in a woman who is tuberculous, what is to be done about it? Should pregnancy be terminated, and when, and how: or should it not be terminated: and if not, then what can be done? Into these decisions many considerations enter.

Three schools are described by Schauta. One teaches that abortion should be done on every pregnant woman who has tuberculosis; the second that abortion should never be done but the best of treatment given, and the woman allowed to go through with her pregnancy; the third, that there can be no fixed rule and no general indication, but every case must be considered and decided by itself.

The avoidance of pregnancy is one thing and the interruption of pregnancy quite another. Ordinary human feeling and the religious teaching of many hold the emptying of the uterus and the destruction of the fœtus excusable only when life is to be saved thereby. The law of the land rightly holds the emptying of the uterus for any other reason to be criminal malpractice.

The problem is essentially one of prognosis—judgment as to the probable outcome of the tuberculosis, handicapped by pregnancy and what follows, or, on the other hand, relieved so far as an abortion can relieve it. It is not an obstetrical problem. A wise prognosis in tuberculosis is much more difficult than diagnosis or treatment, and comes only through long experience. The elements which enter into such an estimate can only be briefly indicated. Time is an element in resistance. Long duration is more favourable, other things being equal, than short duration, and quiescence and evidence of arrest are more valuable the longer they have lasted. Small extent of disease, again other things being equal, is much better than greater extent, but not infrequently extensive old chronic disease may give a much better outlook and bear burdens better than a smaller, newer and more active lesion. Activity, even slight, and shown by even the slightest symptoms, always means danger. Complications of any sort are bad, especially when added to pregnancy, which is in itself a bad complication. Pregnancy with laryngitis, or intestinal tuberculosis, even the slightest, gives an outlook almost absolutely bad. In a woman under twenty, pregnancy as a complication to tuberculosis is more serious than in a woman beyond twenty. Out of these and many other elements must be built up an estimate of the possibilities and probabilities of the patient's power of resistance to the disease with a continuance of the pregnancy, or after abortion.

Into the decision must enter practical as well as theoretical considerations. The conditions under which the pregnancy will be passed, the child born and the mother and child live, must be considered. Under the very best conditions it is possible for a child born of a mother actively tuberculous to get a fair start; under average conditions it is most unlikely, and under the worst conditions impossible. How can a mother in a poor home, herself with active disease and in need of care, with other children dragging at her skirts, give anything like a fair start to the latest born whose coming was, from all points of view, a mistake? A consideration of that mistake, how great it is, should enter into the decision for or against release from pregnancy. It is better to sacrifice an unborn fœtus than a mother and a little child.

What chance is there of improvement in the tuberculous condition if pregnancy be terminated? Unfortunately, while an operation can undo the pregnancy, it cannot by any means undo all its evil effects. It cannot make all conditions as though pregnancy had not been. Too often the flare-up of disease due to pregnancy goes on unchecked though the pregnancy be ended. While the second school described by Schauta, teaching that no tuberculous woman should have an abortion, has not prevailed, the present tendency is distinctly toward conservatism, and is so because abortion even if done in the first three months is not infrequently disappointing in its results. That it does save life in some cases, however, is undoubted.

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*Part 1, dealing with the effects of Pregnancy on Tuberculosis, was published in January.

To wait and bring about premature labour offers no advantage and many disadvantages. The only wise interference is within the first three months if possible, and on no account later than mid-term. Some recommend not abortion but hysterectomy.

If pregnancy should be allowed to continue in a woman with any tuberculous activity whatsoever, there is one course only to follow. She must "take the cure" of rest and care absolutely, once for her tuberculosis and twice for her pregnancy. Even slight symptoms indicate rest in bed all through pregnancy and for months after the child is born. Almost as strict a routine should be followed by a woman whose uterus has been emptied. For a woman with old tuberculosis now latent much the same routine should be recommended, should pregnancy occur.

In many cases of pregnancy with tuberculosis the decision for or against interference has to be made, and such decisions are always difficult. Men whose opinions should carry weight differ in their teaching, as one leans toward interference and another toward conservatism. But upon this all agree, and this dictum practically all repeat: that no rule can be made, but each case must be considered by itself; and upon this also all agree, that the problem is not obstetrical but medical, a matter first of the most careful estimation of all elements in the prognosis of tuberculosis, and then of constant supervision and control by one wise in the ways of tuberculosis.

Funk of Philadelphia considers that "If the tuberculous lesion is early and active, the pregnancy should be terminated if it has not gone beyond four and a half months." If interference at once is not imperative he would put the patient to bed for a time for close observation. Activity of the tuberculous lesion in spite of this rest should decide for interference. "If the tuberculous lesion is early and inactive, in a patient who gives a previous history of sanatorium care and in whom signs and symptoms are those of an arrested or cured case, the pregnancy should be left alone." If activity appears, he would terminate the pregnancy, but adds: "If the tuberculosis is so acute that the termination of pregnancy would seem immediately necessary the chances are that such a termination will not help an already overwhelming lesion."

Elliott, who is inclined to be conservative, considers that "There are no rules we can follow which will aid us to determine with certainty which cases will bear the added strain of pregnancy well and which badly. It is equally difficult to determine in what cases an abortion will improve the future prospect of the pregnant woman. As in all forms of treatment of tuberculosis, we must individualize; all rules fail. Intervention after the fifth month rarely gives satisfactory results. Prior to the fourth month, it is possible that the mother's future may be improved by emptying the uterus through the modern operation of vaginal hysterectomy."

Van Voornveld, writing in the *Swiss Journal of Surgery*, expresses the common opinion that no general rule can be given, but that the activity of the focus should decide. Holding firmly to the belief that the most damaging feature of the cycle is the sudden re-expansion at delivery, of the diseased lung which has been compressed by pregnancy, he considers artificial pneumothorax a procedure of especial value. In certain cases he would decide upon abortion if lung collapse were not possible, but if the lung could be collapsed by artificial pneumothorax, he would allow pregnancy to continue to term.

Bandolier and Roepke consider that "With manifest active tuberculosis artificial abortion is indicated. The bad effects on the disease will not be thereby always prevented, but the trial must be made." They add that "Artificial induction of premature labour has no advantage whatever over normal confinement. Results of interference are relatively good if the operation is performed early—that is, early in the pregnancy. After five months, induction of labour must as a rule be avoided."

The summing up of C. H. Davis of Milwaukee is a little more unfavourable to interference. There is, he considers, no certain means of determining which patients will be benefitted and which harmed by abortion. He quotes Bacon as considering abortion justifiable in not more than ten per cent. of tuberculous pregnant women; Veil, as reporting no improvement following abortion in 43 per cent. of the cases collected by him; Trembly, as having had in his large experience so varied results that a general summary was not possible; and Von Bardleben as stating that 50 per cent. of his patients died after abortion.

John Ritter of Chicago puts doubtful cases to bed. If symptoms of tuberculosis subside, the pregnancy is not interrupted. If the symptoms do not subside, interference somewhat improves what is in any case a bad prognosis.

Fishberg's summing up is to the effect that—"Pregnancy is a grave complication of phthisis and in incipient cases it is advisable to induce abortion whenever it occurs."

Douglas and Harris consider that with active tuberculosis therapeutic abortion is indicated when the lesion is early or moderately advanced, or extensive and quiescent, or when complications are present.

Much the same conclusion is reached by Norris and Landis, who think that, "Prior to the fifth month the uterus should be emptied if the disease manifests evidence of becoming active, or if the lesions are extensive or laryngeal involvement occurs." Interruption of the pregnancy, they consider, "does not ensure an amelioration of the pulmonary condition, but does definitely improve the prognosis." They estimate that about 65 to 70 per cent. of patients prior to the fifth month will be definitely improved by the emptying of the uterus as soon as acute symptoms arise, provided proper after-treatment is carried out.

McSweeny's experience has been so varied that he can offer no sure rule. In his series, "Some who were thought to have a poor initial prognosis seemed to progress favourably; others retrograded when it was unexpected. . . . . To answer the question as to the termination of pregnancy in the individual case is extremely difficult, and perhaps the best way is to imagine one's self in the position of the tuberculous woman and then decide."

My own practice has been very conservative, and I do not think I have more than twelve times is as many years advised that pregnancy be interrupted. What little experience I have had, and a study of such statements as have just been quoted, leave me with the opinion that though conservatism is the proper tendency, my own practice has erred in being too conservative; and that interference would have been the better choice in some cases in which I advised against it.

The whole subject of the relation of maternity to tuberculosis is of importance away beyond any general interest or special study so far given it. Bacon estimates that between 24,000 and 36,000 women, with a more or less active tuberculosis, come to child-bed each year in the United States; that more than one per cent. of all pregnant women have tuberculosis active enough and advanced enough for definite diagnosis; and that of all women who die of tuberculosis between twenty and forty, one quarter break down during the child-bearing cycle. Bacon's estimate, if applicable to Canada, would show three thousand pregnancies occurring each year in Canada in women with active tuberculosis.

It is scarcely necessary to point morals which are self-evident.

1.—The occurrence of pregnancy with active tuberculosis even once in one hundred maternity cases establishes this complication as one general practitioners and obstetricians should have definitely in mind. It is perhaps a counsel of perfection to urge a complete chest examination early in every pregnancy (and before every surgical operation also), but even the slightest sign or symptom or suspicion should be considered to merit not a cursory look-over, and a bland assurance of safety, but a thorough examination and investigation. And when during pregnancy or the puerperium symptoms of real illness occur a flare-up of tuberculosis should be one of the first possibilities to occur to the thoughtful physician.

2.—When tuberculosis has been found in a pregnant woman, or pregnancy occurs in one known to be tuberculous, no time should be lost in having the best estimate possible as to the extent and severity of the tuberculosis; in deciding what is best to be done and in getting it under way. The Sanatorium routine is the minimum in such cases.

"Watchful waiting" in such a case is a dangerous motto. The first half of pregnancy will likely go well; it is after mid-term as a rule that trouble begins. But interference is inadvisable after mid-term. So interference must usually be considered and decided for or against, while yet very little trouble has occurred. Forecast, not observation, must rule. The problem is one essentially of prognosis; prognosis of the tuberculous disease, not of the pregnancy.

3.—Bacon has advocated, and McSweeny, on Staten Island, and Dr. Dobbie, at Weston, have organized special hospital sections for the care of tuberculous women, during and after delivery, and of their infants. In every centre of population such provision should be made.

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Clinical Laboratory Service for Physicians. Laboratory methods now play a large part in the daily work of physicians. Chemical, morphologic, bacteriologic and serologic methods, as well as the roentgen ray, are in daily use everywhere, and new methods—for example, the electrocardiographic determinations and tests of metabolism—are being introduced. To meet the constantly growing needs for such methods, there have come into existence laboratories of health departments and of hospitals, with more or less differentiation into separate departments; also wholly private laboratories. The latter group includes those frequently referred to as commercial, because dependent on fees, and the individual establishments of physicians working alone or associated in groups. The old time pathologist, the prototype of the modern laboratory physician, whose function in clinical diagnosis was to determine the nature of lesions from gross and microscopic examination of tissues, has undergone differentiation into clinical chemist, clinical bacteriologist, clinical serologist, clinical microscopist, and roentgenologist, and there has come forth a formerly unknown adjunct to medical practice, the laboratory technician. So rapid has been the evolution of the clinical laboratory and the extension of laboratory methods in all fields of medicine, that frequently fear is voiced lest much work that should be done by physicians is being entrusted to incompetent substitutes.

Analyzing the situation, we must reckon first with the fact that the great majority of private practitioners, for various reasons, lack of time being an important one, are prevented from making any but the simplest routine tests themselves. Therefore they must turn to someone for help, and the privately owned laboratories offer their services. The laboratory features of the proposed health centres or of institutions financed and controlled by the community are attractive to many physicians and are idealistic. They represent a condition in which the same type of service would be rendered to all of the physicians in the community, the cost being reasonable and equally distributed. Physicians are responsible to their patients, i.e., the public, for the character of laboratory service supplied. The results of tests and examinations must be accurate; the fees for such tests must be equable. The conditions in some of these laboratories are such that thoroughly competent and well-trained physicians have been attracted by the work. It is desirable that similar conditions develop in all laboratories so that well-trained physicians, and not incompetent technicians, become responsible for laboratory service. —(Journal A.M.A., November 5, 1921).

Case Reports

ARTERIOSCLEROSIS AND ANGINA PECTORIS WITH TEMPORARY MUSCULAR PARALYSIS

D. G. Campbell, M.D.

Physician to the Out-Patient Department of the Montreal General Hospital

Miss B., age 65, M.G.H. 3310-1919, was admitted to the hospital deeply unconscious.

Previous history.—She has always been well with the exception of attacks two years ago that were similar though much less severe than the present one.

Present illness.—This began ten days ago, when on her way to church she had an attack of an anginal character of short duration. For the next few days she remained at home and rested. Three days ago while on the street, she had a second attack, followed by vomiting and a short period of unconsciousness. The third seizure occurred one day ago. This too was followed by nausea, vomiting, and a short period of unconsciousness. The nausea and the discomfort in the chest were more persistent than previously.

Examination.—There were no cerebral signs or symptoms. She was confined to bed on account of nausea and pain in the epigastrium. There was no abdominal tenderness or rigidity. The temperature was normal, the pulse was 120 and regular. Superficial arteries were thickened. Examination of the heart showed it to be normal, except for marked accentuation of the aortic second sound. In the afternoon of the same day she suddenly became deeply unconscious, perspired profusely, had stertorous breathing, the tongue protruded to the left, and every few minutes there were convulsive seizures involving the right side of the face, the right arm and the right leg. The left arm was apparently completely paralyzed, and the left leg moved only when the sole of the foot was irritated. The left pupil was larger than the right; both reacted to strong light. Blood pressure was 160 systolic, 110 diastolic.

A diagnosis of cerebral hæmorrhage was made and the patient was admitted to the hospital. By the evening of the same day she was conscious and rational, but rather dazed. All the signs and symptoms disappeared during the following three days, when she went home apparently completely recovered.

Five days later she suddenly became aware of an impending attack, the most prominent features of which were nausea and a feeling of intense constriction in the chest. This was soon followed by an attack similar to, though less severe and of a shorter duration than the recent ones. The heart beat remained weak and irregular and the blood pressure was 100 systolic, 70 diastolic.

She died suddenly in an attack the next day.

Diagnosis.—Arteriosclerosis generalized, angina pectoris and intermittent claudication.

Summary and remarks.—Female, unmarried, 65 years old, who had been well until two years ago, when she had several mild attacks of angina pectoris. During a period of two weeks she had had several similar attacks which increased in intensity and were accompanied by nausea, vomiting, unconsciousness and paralysis. She suddenly died in one of them.

Sir William Osler (*Jour. Can. Med. Assoc.*, October, 1911) who has reported several cases, among them one of the former professors of McGill Medical Faculty, accepts Peabody's explanation as the most probable cause of the cerebral signs and symptoms: that there occurs spasmodic contraction of the muscular coats of the middle cerebral artery or its several branches, which in connection with the narrowed lumen due to sclerosis, leads to a decreased blood supply to the brain tissue supplied by the affected artery. This may occur a number of times without permanent damage. If, however, the constriction is of sufficient duration, permanent damage with degenerative changes will take place, or if the vessel involved supply a vital area, death will follow.

The importance of recognizing this condition is obvious both from the viewpoint of prognosis and treatment.

It seems likely that such cases are not rare. Two similar ones have recently occurred in my own experience. One, a man age 60 years, whom I had seen previously in several attacks, was admitted to the hospital three times deeply unconscious and apparently dying. From each of these attacks he recovered completely. He died suddenly in a final attack.

The other patient, a female, 82 years old, had had a number of convulsive seizures accompanied by transient aphasia and paralysis. She died in one of them.

RAYNAUD'S DISEASE OF FOUR YEARS' DURATION, ACUTE FATAL TERMINATION WITH SIGNS OF INVOLVEMENT OF ARTERIES OF CENTRAL NERVOUS SYSTEM

K. E. Hollis, M.D.

West Toronto

The severe forms of Raynaud's Disease, with signs indicating involvement of visceral arteries are mentioned in most standard works, but are only rarely described. The following case had the fatal issue with interesting puzzling symptoms, indicating an acute cerebro-spinal affection. Co-incident with these symptoms was the demonstration clinically of the severe gross lesions picturing Raynaud's Disease.

Mrs. K., who had been under the observation of Dr. MacNamara and myself for four years, with active recurrence of painful asphyxia of the fingers of both hands, presented herself with "dead" white fingers and pain of the left hand on November 28, 1921. The radial pulse gradually disappeared, and pain, the intensity of which was terrific, soon appeared. Within twenty-four hours the right hand was cold and the right radial pulse had disappeared. Morphine, and, at times, chloroform were necessary to relieve the pain in the left hand and forearm. A few hours later, both feet were white, then blue, and were paining intensely, though the tibial arteries remained pulsating. Complete flaccid motor paraplegia now seemed to be present and incontinence of both urine and fæces was added to the clinical make-up. The reflexes seemed to have been lost. In the next short while, ptosis of the right eyelid, and right internal rectus weakness, were clearly evident I was unable to examine the eye-grounds. The right arm now became pulseless from the mid-humerus down, and quickly blackened. The right foot became very blue. The intense pain of the left hand persisted. This hand showed no cyanosis.

After a period of relative comfort, the patient went into a "status epilepticus" and died following six or seven hours of convulsions.

I was not familiar at the time with the described conditions of cerebral complications of Raynaud's Disease, the general diffuse involvement in this case suggesting both brain and cord affection, plus (one might say, from the agonizing pain) peripheral nerve or root lesions, made one wonder if perhaps an encephalitis or a rapidly generalizing neuritis was appearing in a patient already suffering from Raynaud's Disease.

A classical description by Sir William Osler of the cerebral complications of Raynaud's Disease convinces me that my case can be filed with the cases he described. Transient aphasias and hemiplegias are not uncommon in Raynaud's Disease; abdominal crises have been described. There are several cases reported to have had epileptiform convulsions with the recurring cyanosis of the extremities. The demonstration of spasm of a retinal artery in Raynaud's Disease is put forward at times as evidence that there is such a condition affecting the arteries. Cases of Raynaud's Disease dying with signs of cerebro-spinal involvement are rare, but the association of conditions in this patient are suggestive to a degree.

There was no generalized thickening of the arteries, and, save for a slight fever, the physical and laboratory examinations were strikingly negative. Neither spinal puncture nor Wassermann tests were performed.

A CASE OF ACUTE OBSTRUCTION DUE TO CYSTIC DILATATION OF THE APPENDIX (HYDROPS OF APPENDIX)

E. J. Ferg, M.D., and W. A. Chestnut, M.D.

Moosomin, Sask.

The following case, which occurred recently in our practice, seems to us sufficiently interesting to warrant reporting.

The patient, a male, aged 67, was admitted to Moosomin General Hospital December 13, 1921, complaining of severe abdominal pain, vomiting, and total constipation of 4 days' duration.

Personal history.—Patient is well nourished and of robust physique. He is a farmer, and in spite of his age is still able to do a good day's work on the farm. During youth and adolescence he had a number of attacks of abdominal pain which lasted three or four days at a time. He does not remember the details of these attacks, but it may be inferred that they were attacks of catarrhal appendicitis. These attacks left him at about 25 years of age, and have not troubled him since. He has remained healthy all his life till about five years ago, when he began to have a mild degree of "indigestion," with slight "cramps' in the abdomen, and flatulence after eating a heavy meal. These symptoms, however, were never severe, and never caused him to stop work or seek medical advice. He has never been constipated, and bowels have always moved easily by mild laxatives. In 1918 he had influenza, and as had a mild chronic bronchitis since.

Present illness.—Began four days prior to admission, with severe pain in the abdomen of sudden onset. He immediately stopped work and went to bed, where he remained till admitted into hospital. On the first day he took a large dose of salts and applied a hot water bottle. This gave no relief, and on the second day he took a larger dose of salts and a dessertspoonful of cascara, also gave himself an enema but there was no bowel movement whatever. For the next two days he continued the use of various cathartics in large doses, also repeated enemata, without effect. During this time the pain persisted, and he vomited several times a day. On the fourth day a doctor was called, and acute obstruction diagnosed. High enemata, pituitrin, cathartics, etc. were administered without result. By this time there was considerable rigidity, tympanites, and vomiting of dark coloured fluid with fæcal odour. The temperature was normal, and pulse 90. Operation was then decided upon. Owing to the slight bronchial affection and his advanced age, we were inclined to operate under a local anæsthetic, but fearing that a resection would probably be necessary, and as there was a great deal of distension, we finally decided to take chances on chloroform anæsthesia.

On opening the abdominal cavity there was considerable trouble with distended small intestine, and the patient's general condition was none too good. This, however, improved, and we were able to search the entire length of large and small intestine carefully. There was much distension of the small bowel with gas and fluid. The large intestine was empty and collapsed. There was no free fluid, nor any sign of inflammatory process in any part of the abdominal cavity. No adhesions. On exploring the right iliac region a tumour was felt, which when delivered from the abdomen proved to be an enormously dilated appendix. The meso-appendix extended about half way down the length of the tumour, and was drawn tense by the enlargement and turgescense of the cyst, as it appeared to be. At the ilio-cæcal junction there was a kink produced by the drag on the meso-appendix. The meso-appendix was severed and ligated, and the cystic appendix clamped off and removed at its junction with the cæcum. When this was done the kink mentioned above straightened out without further manipulation. No further pathological condition could be found and the abdomen was closed Eight hours later the bowels moved copiously, and continued to move regularly thereafter.

The tumour removed was, as stated above ,an enormously dilated appendix. The walls were thinned out to about the thickness of parchment and were quite transparent. The contents were under considerable tension and the whole tumour was quite translucent. It was about the size and shape of a large pear with the small end toward the cæcum. There were no adhesions whatever, and no evidence of recent inflammation. The contents proved to be about five ounces of a clear gelatinous material, resembling in consistence Wharton's Jelly. There were no concretions, nor any other foreign matter. The opening into the cæcum was completely obliterated. The internal surface of the cyst was smooth and white, and shewed no evidence of inflammation or ulceration.

The tumour had by its drag on the meso-appendix and its attachment close to the ilio-cæcal valve, produced the kink, with resulting obstruction.

The further history of this case was most unfortunate and disappointing. He progressed favourably, took food, and felt comfortable till the fifth day after operation, when he suddenly developed a chill, rapid respirations, and cough with high temperature: broncho-pneumonia having set in, we believe, as the result of the anæsthetic in the face of his previous bronchial condition. He died of pneumonia on the ninth day after the operation.

We have never seen nor heard of a similar case, and there is no description in the common textbooks of the combination of cystic dilatation of the appendix and intestinal obstruction resulting therefrom. This, with the immediate relief afforded by operation, has prompted us to publish this case. There is also the lesson to be learned from the choice of anæsthetic, which we trust may be of some use to others as it certainly has been to us.

Retrospect

THE QUINIDIN TREATMENT OF AURICULAR FIBRILLATION

C. F. Moffatt, M.D.

Montreal

Within recent years no drug in use in cardiac therapeutics has caused such startling results and stimulated so much clinical and experimental research as the newly-introduced quinidin sulphate.

As so often happens, the discovery of its power was accidental. In 1914 a patient who had malaria and was also subject to attacks of auricular fibrillation, noticed that the taking of quinin relieved his palpitation. He reported his observation to his physician Wenckebach, who made the first report on its power to change auricular fibrillation back to a normal rhythm. Since that time many continental workers have used the drug with varying results, prominent among them being Frey, who in 1918 reported a series of cases using quinidin in preference to quinin. Following upon his results, work upon the drug was stimulated on this continent and within the past year quinidin has been administered and the results carefully checked and reported.

As its name implies, quinidin is a dextrorotatory stereoisomer of quinin: quinidin sulphate, being most soluble, is used.

In 1893 Santesson, and F. B. Hofman in 1915, working experimentally, concluded that quinidin depressed alike the rhythmicity, contractility and irritability of heart muscle. Boden and Neukirch similarly found that quinidin slowed the heart rate and shortened the auriculo-ventricular conduction time, and resulted finally in paralysis of the ventricles.

Lastly, results of great clinical importance were obtained by Lewis and his co-workers Drury and Iliescu, who employing the electrocardiograph found that it progressively slowed the auricular rate with a corresponding increase in the ventricular rate due to a decrease in the auriculo-ventricular block. These observations explain and are borne out by clinical results.

There is considerable diversity of opinion as to the proper dosage in which the drug should be administered, partly explained by the great variation in the quantity of drug required to produce results: from three grains to two hundred and forty grains within a period of ten days.

All clinicians are agreed, however, that as some patients exhibit an idiosyncrasy to the drug, a preliminary small dose of six grains in two doses should be tried. If no distressing symptoms appear then the drug may be given in fairly large doses. Within certain limits it would appear that the larger the dosage the greater percentage of successes. In the series of 18 cases reported by Jenny there was only one failure, but this result was obtained only after very large amounts had been administered: 240 grains within a period of ten days. To achieve these optimal results it would seem best to administer the maximum dosage compatible with safety in as short a period of time as possible. Elimination is rapid and no accumulative effects have been noted.

All types of auricular fibrillation were treated, and up to the present no particular class of case reacted more favourably than another, with the possible exception that fibrillation of recent date reacts more favourably than an old established condition. The age of patient has no apparent influence. The type of lesion was of less import than the degree of loss of compensation; those with pronounced loss of compensation did not appear to respond favourably. In these cases the symptoms were due not so much to the rregular rhythm as to the degree of decompensation, a fact which must be taken into consideration in using the drug. For this reason many authors recommend that a preliminary treatment of digitalis and rest be given until compensation be restored.

Most observers are agreed that the combination of digitalis and quinidin is not without danger, as the two drugs are antagonistic in their action and their combined use tends to lessen the chances of a return of a normal rhythm.

As to the improvement noted after the return of normal rhythm, there is also a difference of opinion among clinicians. As pointed out above, the chance of success as regards improvement in the patient's feeling will depend upon how much these sensations are directly due to the irregular rhythm or to the decompensation due to myocardial changes. The fact remains, however, that a great many patients have felt remarkable improvement after its use, particularly in respect to painful præcordial sensations and their ability to respond to exercise. It is in the paroxysmal type of cases due to various toxic agents, that the quickest response and the more lasting effect is to be expected. In those cases of fibrillation due to extensive myocardial changes, relapses are frequent, but as a rule they respond to repeated dosage. In order to prevent such relapses it is recommended to continue the drug in small doses, very much the same as is the custom when using digitalis.

As yet it is impossible to define the length of time in which the normal rhythm will persist. Up to the present nine months seems to be the longest period reported.

It is not uncommon to have patients complain of nausea, headache and increased palpitation with a small rapid soft pulse at a stage just preceding the transition to normal rhythm. Here it is that excessive caution may lessen chances of a favourable outcome. However, all observers are agreed that this powerful drug is not without danger. Sudden death, alarming collapse with respiratory failure and several unpleasant results in the form of embolic infarcts have been reported. In one series of five fatal cases, four presented the heart in a badly decompensated state, from which it may be inferred that decompensation should first be treated before administering quinidin.

Summary.—The general consensus of opinion is that:

1.—Quinidin checks auricular fibrillation in about 50 per cent. of the cases: the more recent the onset the more favourable the outlook.

2.—With the return of normal rhythm the general condition is frequently improved; occasionally a very striking improvement is noted, even when digitalis has failed to maintain compensation.

3.—Quinidin should be given only after decompensation has been treated by other methods, after an exact diagnosis has been made, and when the patient is kept under careful supervision.

4.—The combination of digitalis and quinidin should be avoided.

5.—When used, quinidin should be carefully controlled by every available means.

6.—That its use is not without danger.

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Physical Standards for Working Children.—The problem of the regulation of child labour, like many other social and economic questions, takes on broader aspects and relations the more carefully it is studied. The difficult point to determine is, at what age and under what conditions can a child begin to work without endangering his future physical and mental development? Prohibition of the employment of children in certain tasks and the creation of an arbitrary fixed minimum wage for entrance into any employment are only partial solutions of the problem. Any permanent and fundamental legislation requires the establishment of standards of physical fitness which all children entering employment should be required to meet. The creation of such standards, in turn, requires the formulation of definite standards of normal development for the use of physicians in examining a child applying for a permit to work. To fill this need, the Children's Bureau appointed a representative committee of physicians to formulate such standards. Their report appears in Bulletin 79 of the Children's Bureau, consisting of general recommendations regarding methods of examination, a standard record sheet of physical examinations for employment, for the use of the examining physician, and an instruction chart for physicians in making such examinations and filling out reports. The bulletin is a preliminary one, and it is expected that from time to time the results of further scientific research and practical experience in this field will be published.—Jour. Amer. Med. Assoc., September 17, 1921.

Editorial

ON THE NATURE AND ORIGIN OF THE ANGINAL SYNDROME

SIR CLIFFORD ALLBUTT, in his work on "Diseases of the Arteries," published a few years ago, stated that he regarded this distressing syndrome as due to a morbid exaltation of the sensibility to tension of the tissues of the aorta near its junction with the heart. Here at the entrance to the aorta, where tension is transferred into velocity, we expect to find the most sensitive area and the most efficient afferent nerve supply. He terms the lower portion of the ascending aorta, the anginiferous area, which though in this spot most sensitive may at times extend as far as the arch. In the treatment of angina he emphasizes the value of a period of complete rest, long enough to calm this central lability. The danger in his opinion consists in the awakening of the inhibitory afferent which by an over-protective action only too often in attempting to save the part sacrifices the whole.

Sir James Mackenzie in a recent essay on Angina Pectoris (*Oxford Medicine*, Vol. II., p. 423) enunciates the view that pain in this affection is to be regarded as an expression of exhaustion of the heart muscle. This view he considers gives us the best idea of the condition we have to deal with. The anginal syndrome may appear in many forms of disorder of the heart; frequently in those associated with gross disease, but occasionally in hearts in which the musculature is only temporarily exhausted. At the same time Mackenzie admits ignorance of many factors necessary to a full understanding of the exact etiology of the pain, the severity of which must not be regarded as a true index of the actual seriousness of the case. Only by a careful examination of the conditions provoking the symptoms can an estimation be made of its importance. The association of angina with disease of the coronary arteries has been so frequently recognized at autopsy that some clinicians regard its occurrence as almost definite evidence of coronary disease; the pain has been actually referred to the arterial walls. If, however, we look upon disease in these arteries as interfering with an adequate supply of blood to the heart muscle, thus impairing nutrition and leading to rapid exhaustion on slight exertion, a truer picture of the nature of the complaint in Sir James Mackenzie's opinion is obtained.

Of the pathological changes leading to the anginal syndrome, Mackenzie after the examination of many hundreds of cases, makes the following grouping:

1.—Changes in the arterial walls in people in advanced life, leading to a deficient blood supply to all the tissues in the body, but more especially to those of the heart.

2.—Changes chiefly manifested in the coronary arteries proceeding rapidly, despite treatment, to a fatal ending.

3.—Hearts in which the valves have been much damaged, especially the aortic valves.

4.—Chronic lesions in the kidney, with high blood pressure.

5.—A small group of rare conditions difficult to classify.

In connection with the third group, in which damaged valves play an important part, Mackenzie states that although anginal pain indicative of muscle exhaustion may be associated with mitral valve disease, it is not met with so frequently or in so severe a form as it is in lesions of the aortic valve. Anginal pain is also often associated with a rise in blood pressure, and it may also, in his opinion, be provoked during periods of exhaustion such as may occur in persistent sleeplessness.

In opposition to these views, which give a purely cardiac explanation of the anginal syndrome, Sir Charlton Briscoe, at a recent meeting of the Harvian Society in London (*Brit. Med. Jour.*, December 19, 1921) put forward the view that the anginal syndrome may be due in great measure to respiratory spasm. He said that he considered the causes of an anginal attack were such as to place a strain upon the respiratory as well as upon the circulatory apparatus; and also that no adequate explanation has been forthcoming for nocturnal attacks on the theory that the syndrome arose from circulatory stress; whereas such attacks are much more consistent with a theory of respiratory origin. Referred pains may arise from tender over-fatigued skeletal muscles. The anginal syndrome in Sir Charles Briscoe's opinion was due in great measure to over-fatigue of the several muscles acting on the upper respiratory apparatus. The triangularis sterni is in constant operation during life, but through degenerative changes and strain may become tender and refer pain to the back of sternum or outwards to the axilla; the scaleni and intercostals of the first five spaces under similar conditions may refer pain to the arm, shoulder, or anterior axillary region. The composite referred areas of these muscles present a picture similar to the areas of pain in angina. Sir Charles Briscoe stated that in his experience, instantaneous relief was possible when assistance was given to the expiratory muscles of the upper thoracic segments. His general conclusions were summed up as follows: Such fatigued muscles are excited under the same conditions as are usually associated with anginal attacks; these respiratory muscles when tender may refer pains to those areas which are affected in the anginal syndrome. In his experience treatment by pressure proved effective in relieving the attack. Progressive ossification of ribs and cartilages in advanced life might be one of the causes leading to this respiratory stress.

Sir Sydney Russell Wells in the discussion that followed remarked on the fact that by many, the purely cardiac explanation of angina was being discredited. Not only had Sir Charles Briscoe assailed it from one side, but another recent writer regarded it as entirely of gastric origin. In grave degenerative disease of the arteries, it was not only the aorta which was affected; it was quite conceivable that the widespread changes which went on in the chest set up an irritable condition of the muscles, and was a factor in the induction of these referred pains. Sir John Broadbent admitted that the pathology of these referred pains was not easy of explanation. He did not consider that one cause only, such as failure of contractility, whether from defective blood supply or from degenerative changes in the muscle itself, would completely account for it. Sir James Mackenzie in a previous explanation of angina had stated that he considered the characteristic gripping pain was caused by a spasm of the intercostal muscles. He thought that the solution of the question turned on which was the cart and which the horse. Was the contraction of the respiratory muscles as the sequel of an angina the explanation of the pain; or, was the pain caused by the spasm of the respiratory muscles, the primary condition?

Dr. Wiltshire did not consider it wise to give up a cardiac explanation for many forms of angina. He did not think that Sir Charles Briscoe claimed to have solved the whole riddle, but only to have furnished some facts in regard to those cases which could not be definitely labeled or docketed under previous groupings. Insofar as he had done this, he had helped the rest of them to reach a stage nearer the truth. He thought that in the present state of our knowledge it would be wiser to regard angina as not necessarily only a cardiac phenomenon.

BODILY TEMPERATURE AND HIBERNATION

THOSE animals which maintain a steady temperature higher than that of their surroundings are birds and mammals. The lower vertebrates and the invertebrates tend to assume the temperature of their surroundings, becoming active in warm weather, dull and sluggish in winter.

The acquisition of homoiothermy in the process of evolution became possible only with the development of a non-conducting coat of hair or feathers. Where hair is sparse or absent in mammals, as in whales, in the pig and in man, a subcutaneous layer of feebly vascularised fat takes its place. Under the skin of a sheep, which has a natural, warm, woolly covering, there is no blanket of subcutaneous fat as in the more naked animals. This inverse relation between the development of an external hairy or feathery jacket and of subcutaneous fat is consistently observed in the higher vertebrates.

In winter certain members of the more primitive orders of mammals, or rather of the Eutherian group thereof, become temporarily cold-blooded and pass into a state of hibernation, in which they take the temperature of their surroundings and have a very slow metabolism. To avoid death by freezing, as in the Canadian climate, they retire to deep burrows underground, where the frost begins to penetrate, if at all, only by the end of the winter. Now, investigation has shown that there is a deep-seated physiological difference between the more vital tissues of hibernating and of non-hibernating mammals. The excised heart, for example, of an ordinary mammal ceases to beat when the temperature of the perfusion fluid falls to about 1° C.; on the other hand, the excised heart of a hibernating mammal continues in activity at any temperature down to the freezing point of cardiac tissue (Tait). A corresponding statement seems to hold true of the activity of the respiratory centre; a dog chilled by exposure has his respiration paralysed at a temperature away above that at which the respiration of a woodchuck proceeds without hindrance. Thus the vitally important tissues of the higher mammals are adjusted to function within a more circumscribed range of temperature than those of hibernating mammals. It is difficult to be sure whether the power of hibernation represents an adaptation developed by northern animals since the homoiothermic mammalian stock was created, or whether it represents a retention of an endowment once common to all the mammals. The balance of evidence is perhaps in favour of the latter contingency.

SIMPLE GOITRE IN MAN: ITS PREVENTION AND TREATMENT

IN certain sections of this continent over 60 per cent. of the population show a noticeable enlargement of the thyroid; its prevention and treatment is therefore a matter of more than passing interest.

The goitre first appears between the ages of ten and fifteen years and reaches its greatest size between the seventeenth and twenty-second year. A certain number then regress; others pass over into the adenomatous type; a few develop exophthalmic goitre, but the majority persist as more or less permanent enlargements of the gland. During the early stage the gland shows many signs of increased activity. It is enlarged, the thyroid arteries frequently are palpable and may be rolled under the finger, and there is a well defined hum and thrill over the tumour. With all these signs of activity there is no evident increase over the normal pulse rate for the patient's age, and the basal metabolism is usually from 8 to 12 per cent. below the normal rate, showing a deficiency in thyroid secretion. Sections of the glands show a moderate hyperplasia of the epithelial cells of the acini, a marked increase in the amount of colloid, and in a certain proportion adenomatous nodules buried in the enlarged gland will be seen.

Plummer gives the following explanation of this apparent thyroid hyperactivity associated with a deficient secretion of thyroxin. He assumes that the normal stimulus for increased thyroid action is a partial exhaustion of the body's supply of thyroxin. There are several factors which interfere with the production of the hormone and lower the amount of thyroxin delivered by the gland. One of the best known of these factors is an actual or relative shortage of iodine in the body. Another possibility is some disturbance of the cell metabolism which lowers the normal rate of synthesis of thyroxin by the gland. However, even under these conditions a thyroid can deliver the normal amount of thyroxin if it be stimulated to a sufficient extent, but as a rule it tends to lag behind the demands of the tissues, and the basal metabolism shows a corresponding fall. To the increasing stimulation the gland responds by signs of over-activity, and under these conditions tends to put down an excess of colloid in its acini. This constitutes the diffuse colloid goitre of adolescence. In a certain number of cases the stimulation activates embryonal cell nests, which grow into adenomatous nodules. At first these are buried in the colloid, and they only become apparent in the third decade when the colloid material is receding.

These suggestions offer the scientific explanation of the reports of Marine and Kimball on the effects of iodide therapy in the thyroids of a group of school children in Ohio. Their studies cover a period of thirty months, during which they examined 4,495 pupils, approximately one half of whom received sodium iodide, while the others served as controls. Each subject was given 0.2 gram of sodium iodide each school day for ten doses, and this course was repeated at the end of six months. The controls received no medication. At the end of the year the whole group was re-examined and the results were of remarkable interest. Only two out of 902 normal cases developed enlarged thyroids after the treatment was commenced, while 27 per cent. of the untreated pupils showed enlargement at the subsequent examination. Similarly 58 per cent. of those with slight enlargement showed a decrease in the size of the gland after treatment, while only one per cent. showed spontaneous regression of the tumour. The result of the iodide therapy was even more striking in those with moderate enlargement of the thyroid. The iodine was well tolerated by practically all those taking the treatment, and in no instance did signs of hyperthyroidism make their appearance.

Plummer reports similar and even more dramatic effects in this type of goitre, following the use of thyroxin intravenously. The increased vascularity subsides within the first twenty-four hours, and in three weeks the gland, previously the size of the fist, can be felt only with difficulty. Continued use of thyroxin or thyroid extract is required to prevent a redeposition of colloid, and in this respect he agrees with Marine and Kimball that iodide therapy will have the same effects as the thyroid products.

In this regard one may sound a note of warning as to the unwarranted use of surgical and *x*-ray treatment in these cases. There is no hypersecretion of thyroxin, the gland in the strict sense of the word is not over-functioning. A removal of thyroid tissue by the surgeon or a depression of the already disturbed function of the gland by radiation is usually followed by signs of myxœdema or by an increase of the adenomatous nodules in the portion of gland which remains. These are cases where treatment falls into the realm of the physician, as the exhibition of thyroid or iodine, brings about a prompt relief of the condition. Basal metabolism determinations assume an equally important role in these patients, as in those with an outspoken hyperthyroidism.

Plummer's considerations offer a scientific explanation of the well-known therapeutic fact that certain cases of goitre were and are helped by thyroid medication while others are definitely harmed. By the use of basal metabolism determinations these cases can be picked out with certainty, and another step has been gained from the empirical towards the rational application of drug therapy.

REPORT OF THE CONFERENCE UPON HOSPITAL STANDARDIZATION

THE American College of Surgeons, as is the common lot of big public undertakings, has been the target of not a little criticism. Some have said that it was tinctured with commercialism; others that it was too "highbrow"; some have been heard to remark that after all, Chicago was perhaps not the hub of the United States in the matter of surgery; others have said that no more ideal place for headquarters could be found; for some the requirements of admission were based too low, for others too high. It is hinted that some ungenerous spirits have written out the cheque for their annual dues in quite a grudging spirit. But with regard to one thing criticism has been quite lacking. That one thing is the work of the American College of Surgeons in hospital standardization. After all, the need was great, the work that has been done is outstanding, and the result so far has been quite extraordinary. This department of the work of the College has received great commendation and has been widely advertised. It has certainly aroused a very deep interest, and at a meeting of those interested in this department, held in Philadelphia during the recent annual meeting of the College, numerous papers were presented on the various aspects of hospital standardization by men who have been doing work in connection with it, such as Martin, Slobe, Moulinier,; by hospital superintendents such as McEachran and Hayward; by trustees of hospitals, and several general practitioners. Dr. Franklin Martin related briefly the history of the movement and its growth, and stated as the minimum conditions without which, in the opinion of the American College of Surgeons, a hospital could hardly be recognized as a hospital, were first, records; second, an honest and competent staff; third, staff meetings; and fourth, laboratories. The adoption of these as the minimum standard led immediately to a survey of the hospitals in the United States and Canada to ascertain which met this minimum; and for the last three or four years surveyors, employed by the College, have been visiting all hospitals of over one hundred beds. Dr. Slobe gave a summary of this hospital survey during 1921, and the figures are interesting. The total number of one hundred bed hospitals amounts to 761, of which 568, or 74 per cent., were approved as fulfilling the minimum standard. Last year only 57 per cent. were on the approved list. Besides these larger hospitals there were visited during the past two years 704 fifty-bed hospitals. The total number of hospitals visited by the College surveyors during the past year amounts to 1007. Dr. Slobe reported a steady improvement in the case reports and in laboratories, but found that there was still slackness in the adoption of a type of staff meeting which would clearly analyze the clinical results. Dr. Dickenson, of New York, emphasized the necessity and the value of the follow-up system. Dr. Hayward, superintendent of the Montreal General Hospital, declared himself in favour of the typewritten case report, and of a greater use of the staff meeting. Nothing, he points out, makes more certainly for a good *esprit de corps*. The contribution of Mr. Newton Davis, of Chicago, who is the Executive Secretary for the Board of Hospitals and Homes for the Methodist Church, which has control of sixty-five institutions, was particularly interesting as representing the views of hospital trustees. He pointed out that most trustees are ready to be interested in the plan of hospital standardization because they see in it an increase of efficiency from the business point of view. It is easy to convince them that hospital results ought to come under an accounting or audit in the same way as is the custom in general business. The extra expense will not frighten them. One president, at the end of a discussion, said frankly: "We can not afford not to put in the additional equipment; not to put in all the standard requirements, regardless of the expenditure of money that it does entail." Mr. Davis added that in his opinion the body of laymen throughout the entire country are extremely pleased with this great programme of the College of Surgeons, and he enquires pertinently, "Why should they not be?" The whole thing is obviously business-like. He points out that in the last analysis responsibility for every case that comes into a hospital devolves on the trustees.

Dr. Dunott, as Chairman of the Medical and Surgical Section of the American Railway Association, emphasized the fact that the railways generally were taking the position that they would have their men treated only in hospitals that fulfilled the minimum standard.

Dr. McEachran, of the Vancouver General Hospital, gave a concise summary of the rationale of the movement and of what it was accomplishing. Because of the better working out of the case in the hospital; because of better diagnosis; because of more independently applied treatment; because of the staff review conference work, our hospitals are now reporting lower death rates, reduced number of operations, fewer post operative infections and complications, and lastly a shortening of the patient's stay in the hospital. He pointed out further that this movement has created a deepened sense of responsibility in our so-called hospital groups in the care of the sick, both in the hospital and outside. Hospital staffs have become more conscientious; medical men generally have been impressed by the movement, and try to mould their ways to produce better and more scientific results. Boards of trustees are realizing their responsibility, and, consequently, are demanding not merely a financial report but also what Dr. McEachran called a "physical report" showing the physical assets and liabilities, the assets being patients discharged well and improved; the liabilities being deaths, unimproved cases, infections and complications, and from these the trustees make their balance sheet. He pointed out further that the general public is now asking, before they go in for treatment, whether the hospital which they propose to enter is meeting the required standard. The movement has also an economic aspect affecting the nation, because it means fewer deaths, less cost to the hospital, and the patient, and an earlier return of the patient to earning power.

The reviewer is unable to see how anything but commendation can be given to this work of the American College of Surgeons. Its value is incontestable, its rapid growth astonishing, and the amount of good already accomplished quite extraordinary.

Therapeutical and Pharmaceutical Items[*]

Flavouring.—Magnesium sulphate is commonly employed as a purgative rather than sodium sulphate, owing to the greater bitterness of the latter. Yet magnesium sulphate has a concomitant nastiness which makes it harder to cover with flavours. A saturated solution of sodium sulphate containing 20-25% of either Liquid Extract of Liquorice or of a well-prepared Syrup of Lemon (this is easily made by any housewife following the directions of the Pharmacopoeia) makes a very palatable preparation. A saturated solution of magnesium sulphate can best be covered by 20-25% of the Liquid Extract of Liquorice. Syrup of Lemon is by no means suitable as a cover in this case and indeed no other B.L. flavour is at all equal to Liquorice. The following prescriptions will give palatable mixtures with little bitterness, though slightly salty:—

℞		℞	
Sodii Sulphatis	oz..ii	Sodii Sulphatis	oz..ii
Extracti Glycyrrhizæ Liquidi.	dr..ii	Syrupi Limonis	dr..ii
Aquæ ad	oz. ii	Aquæ ad	oz..ii

—J. Deas, Dept. Pharm. U. of T.

Asaya-Neural.—Not long since the medical profession received samples of a "tonic" known as Asaya-Neural. This preparation was said to contain lecithin, glycerophosphates of iron, lime, soda and potash and Avenine and Strychnine, "in view of their well known tonic and stimulating effects on the central nervous system."

Have you ever heard of avenine? Most pharmacologists have not. In 1883 Sanson isolated from oats (avena sativa) an alkaloid which he thought resembled strychnine. Weisser and Kobert each tested it and found it pharmacologically inactive.

A medical man took a dose of this medicine before breakfast. In a few minutes he felt a little gastric distress but disregarding this had breakfast. In a half hour he noticed that his feet were hot and itchy. On examining them, they were red and swollen. This redness spread all over his body, gradually passing from his feet. In three hours, when seen by me, his face was still flushed, his eyelids puffy and his conjunctiva blood-shot. His hands were still red and swollen. A typical case of generalized urticaria.

A careful chemical examination of the sample he brought and of another, by two different methods which should have disclosed the presence of lecithin, failed to do so.

When phosphorus was first isolated from bones and the brain, it was introduced into medicine as a cure for many diseases affecting these structures. While it has an effect on bone growth, none on the brain was ever demonstrated. Later the phosphates were tried with quite negative results, still later the glycerophosphates and later still lecithin. None of these bodies in the least influence the brain. We have no knowledge, in spite of the implications contained in the literature supplied with Asaya-Neural, that brain activity uses up in any way or amount the supply of any of the complex phosphorus-containing constituents of the brain, of which of course lecithin is one. We have no reason to believe that supplying lecithin in the food is necessary for the proper functioning of the body or in any way influences cerebral activity.—V. E. Henderson, Dept. of Pharmacology, U. of T.

Tincture of Digitalis.—Is, according to the British Pharmacopoeia, made by percolating, 10 grammes of digitalis leaves with 100 mils (or cc.) of 70% alcohol. This gives no standard of therapeutic strength. The American Pharmacopoeia lays down a standard of potency which is obtained by test on frogs, and any tincture branded as a Standardized Tincture must conform to this. That this is important may be seen if the tinctures, as obtained by purchase from druggists in Canada, are so compared. Samples examined here have shown a variation of from one-eighth to one and one-eighth of the required strength, a variation of nine times. A clinically therapeutic dose of such a tincture would probably be a toxic dose of the strongest one. This laboratory is prepared to test samples submitted by physicians before June 1st.

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[*] Under the charge of the Committee on Pharmacy, Ontario Medical Association.

A tincture made with 70% alcohol keeps well in a closely stoppered bottle. It deteriorates if the bottle is kept long, i. e. months, after being opened. It deteriorates rapidly (in a week or two) if diluted with water or syrups and often when weaker alcohols are added. A concentrated, tincture or extract if diluted often deteriorates rapidly.

Acid or alkaline solutions (e. g. Tinctura Ferri Perchloride) cause very rapid deterioration.

The concensus of opinion of those who have tested special preparations Digalen, Fat-free Tinctures, etc., are that they are of no more advantage than an ordinary tincture if properly standardized.

How long will the medical profession tolerate this uncertainty in regard to the quality of the drugs with which it is supplied?—N. C. SHARPE, Dept. of Pharmacology, U. of T.

The Association

BULLETIN NO. 1

ENTERTAINMENT COMMITTEE CANADIAN MEDICAL ASSOCIATION

Remember the dates of the Meeting. June 20-23rd. 1920

Provision is being made for the entertainment not only of the members of the Association, but also their wives and children.

"Man cannot live by bread alone."—In other words, —a purely scientific programme would make the C.M.A meeting lop-sided and tiresome, and would result in loss of interest by the members, especially those brain weary and overworked practitioners, who need, and seek recreation and mental rejuvenation, after the exactions of practice.—

—SO—

If you are a sward swatter,—bring along your Golf impedimenta

If Tennis is your athletic hobby,—put your racquet in your trunk, and opportunity will be afforded you to play.

If gratification of a thirst is your main source of recreation,—bring your bottle with you, as Manitoba is a dry country, and Winnipeg has not yet shown any signs of being an oasis.

If you have wild oats that you feel must be sown,—bring them with you. We have the finest agricultural country in the world, and our soil will grow wild oats as well as anything else.

No matter, however, what your tastes and addictions may be, plan to take your vacation in Winnipeg in June next. If you will supply the presence,—we will do the rest.

C.M.A. MEETING, WINNIPEG.

JUNE 20-23rd. 1922.

DON'T FORGET THE DATE

CANADIAN SOCIETY OF ANÆSTHETISTS

The second annual meeting of the Canadian Society of Anaesthetists will take place at Winnipeg, June the twentieth to twenty-second, 1922, in conjunction with that of the Canadian Medical Association.

The programme, which is at present under preparation, will be published later. Those interested are invited to communicate with the secretary, Dr. Wesley Bourne, 34 St. Mark Street, Montreal.

Correspondence

Hamilton, Ont., Jan. 10, 1922

To the Editor:

DEAR SIR:—With your benevolent consent it might be agreeable and worth while to impose on your many readers a few thoughts relating to the "Profession of Medicine and its Practice" as witnessed to-day.

It will be conceded—Lodge work has for some years invaded our ranks, and who will claim that such practice has tended to make us better physicians and more careful and thorough clinicians? Has it not wrought quite the reverse? A carelessness in examination and diagnosis that is quite undeniable. Nor is this all: the profession has suffered in dignity and influence, besides being cheapened in the eyes of the public.

But the end is not yet—industrial contract work and health centres of various kinds have sprung up throughout the land, which means the bartering of professional services, more or less—a few benefitting at the expense of the many.

It has been asked before, by leading clinicians of foremost place, and may reasonably be asked again: "What is to become of the 'general practitioners' and the every-day practice of medicine?" Can our civilization afford to lose them? Shall we all turn specialists?

Moreover—the profession has foolishly enough raised the status of nursing so high, or have countenanced the raising of it (a hospital training of routine work) that its members have almost become a menace to the practice of medicine; *i. e*, a physician and some nurses almost supervise the health centres. A school nurse makes lightning diagnoses of *eyes, ears, noses and throats,* with the unprecedented composure of a specialist, and scarcely falters at skin diseases. The training has been most complete. Perhaps, after it is too late, physicians may wake to the many inroads on the practice of medicine and demand a three years' course in some hospital, rather than five years at our highly-developed university, with the subsequent post-grad. work.

However, have we not some real house-cleaning to do ourselves? Are we as clinicians maintaining the standard (note the word) that Medicine once placed high? Is it our aim to be clinicians in the same sense as was Bright in his studies of *kidney diseases,* 1827; as was Hodgkins, known to us by the disease bearing his name *Hodgkins' Disease,* generally termed *lymphadenoma,* 1852; or Bennett or Virchow by their descriptions of *leukæmia,* 1845; or as was Addison, by his diseases of the *suprarenal capsules,* 1855?

You will observe that dates, etc. have been given; and were these not the days when test tubes and blood counts were little known about? When "blood pressure"—the almost ever-present bugbear to-day of patients over forty—was interpreted by *tension, quality, volume,* and *recession of pulse wave,* plus the study of the condition of the arteries.

These men, and many more, used their God-given senses to the utmost, seeing, hearing, touching and even smelling; and how much did these great clinicians enrich medicine and save humanity? Their works endure; they are classics, nothing less. And what of Harvey, and the opening of the door to physiological study and allied subjects; Sydenham, the English Hippocrates, with his differentiation of the exanthemata; Jenner, who cast out smallpox from civilized countries, and led the way to vaccines, serums, etc.? Where is there such a galaxy of clinicians? Let us ever remember that while surgeons have saved their thousands, clinicians have saved their tens of thousands.

Again—it is stated with worthy intent—these great clinicians used their senses to the utmost. Test tubes, slides, cover-glasses and stains together with cultures, had not been developed, and, however important, the *x*-ray was still undiscovered. Unquestionably they help; but do not these very helps decrease *in a measure* the *acumen* of the clinicians of to-day? Do not laboratory tests outweigh, all too frequently, clinical examinations? We lean on the former too much, and pursue the latter too little.

Sir, it is maintained we need to take our "profession" more seriously. Much more time should be given to *physical* examinations of patients, co-relating the various systems in disease and in health, thus obtaining a true clinical picture of each patient something so frequently lost sight of in laboratory work. Again, the mind and soul cannot be ignored. See the "cults" preying on the people to-day! Cannot some of these burdens be laid at our doors?

Why have we osteopaths, manopaths, and other "paths" among us? Briefly, because we fail all too frequently as *clinicians:* We lack thoroughness in examinations and under-value co-relating what we find.

In a word: let us get back to real clinical medicine. Keep before us the great outstanding clinicians; give thorough and honest examinations to our patients; and without doubt the profession of medicine—a foremost profession—will be greatly enriched by such worthy efforts. Believe me,

Yours truly,

THOMAS WICKETT, '94

DR. WICKETT'S letter, sent in on January 10th, is published for the purpose of stimulating what should exist in any journal claiming to be in touch with the medical profession—an active column of correspondence. Too few letters reach the office; most of the complaints or the few words of encouragement are usually simply picked up in passing, and we welcome a letter from a man who has been in general practice for nearly thirty years. There is much truth in what he says, and everyone will agree with him that Lodge practice does not make us better physicians and more careful clinicians. One feels, however, that health centres should be carefully separated from the criticisms which are aimed at Lodge and Industrial Contract work. A good nurse in a school or an institution proves her worth in short time. Should a nurse attempt to diagnose a serious condition without consulting a physician that must be recognized as the fault of the nurse, not of the system. If a doctor prefers to treat each scratch, each cut, no matter how trivial, he must sacrifice his one great asset in life, namely, *time.* A busy man would welcome the assistance of someone able to take from his mind and from his hands the care of the great run of trivialities. He asks the question, very rightly, whether we are maintaining as clinicians, the standard of medicine, a question which is daily put to all of us, and which does not permit of ready answer. Good clinicians do exist and are always developing, better armed, perhaps, than the wonderful men whom Dr. Wickett mentions because they have the laboratory and its training back of them. One will quite agree with him. that, in many schools, too little attention is paid to observation and to the study of pure clinical conditions, and one hopes for a swing back to the days when each part of a patient's body was subjected to careful observation. It is a good sign when a member of our profession admits that we have osteopath, manopath, and other "paths" amongs us because we fail all too frequently as clinicians and observers, and because we lack thoroughness in examinations.

O. E. B.

DR. MATHERS writes us that some sentences in his paper, excerpts from the writings of other authors, have through the oversight of the printer not been marked as quotations.

Abstracts from Current Literature

SURGERY

Massive Hypertrophy of the Breast. Keyser, L.D.: Surg., Gynæc. and Obstet., December, 1921, Vol. 33, page 607

In introducing his subject the author presents a few of the facts concerning normal mammary development and some of the more commonly accepted theories regarding the physiology. At birth the gland consists of a number of solid epithelial columns terminating at the nipple. Shortly after birth, following signs of mammary activity, these cells become canalized and expressed, leaving a system of branching tubules. At puberty there is an increase in the parenchyma, cells and adipose tissue, when the gland becomes definitely divided into lobes. During pregnancy the epithelial cells increase with a corresponding decrease in the adipose tissue.

The factors which control mammary function are still obscure, givng rise to many theories. There appears to be a close association between mammary function and the organs of reproduction, more especially the ovary. Puberty hypertrophy is almost certainly dependent on ovarian activity. It seems probable that massive hypertrophy depends for its cause on some dyscrasia of the endocrine system. A certain degree of excessive enlargement of the breast is within physiological limits. In pathological hypertrophy there is a diffuse enlargement of the normal differentiated tissue elements of the gland.

The greater number of patients come under observation at 16 years. The enlargement is usually noticed shortly before or after the first menstrual period. The majority of the patients had breasts of from 7 to 10 pounds, but in some cases have reached as high as 64 pounds. The process is more often bilateral. The average period of growth for all patients under 21 was 20 months. Racial and climatic factors apparently have no bearing on the etiology. Pathologically these cases may be divided into two groups: one where the fibro-epithelial elements are hypertrophied and the other where the adipose tissue is increased. The latter condition is extremely rare. Flattening of the nipple is almost always present. There does not appear to be any relation between the degree of hypertrophy and the amount of secretion. Pain of varying degree is occasionally present. Spontaneous diminution in size to normal is known to occur. Sexual anomalies or disease of the reproductive organs may be associated with massive hypertrophies.

Amputation is the only treatment indicated if spontaneous regression fails to occur. Geo. A. Fleet

Jejunal Diverticula. Hunt, E. L., and Cook, P. A.: Ann. Surg., December, 1921, vol. 74, page 746.

The authors place on record two case histories of diverticulum of the upper third of the jejunum, in one of which the diagnosis was made by the x-ray and confirmed by operation, whereby the diverticulum was removed with recovery of the patient and relief of symptoms. In the other case (presented by courtesy of a colleague), a diagnosis of appendicitis was made on account, of abdominal pains, nausea and vomiting, and localized tenderness. A fatal result followed appendicectomy, and autopsy revealed a diverticulum of the jejunum.

The condition is probably more common than one would infer from the small number of cases found in the literature and should be borne in mind when at operation a suspected lesion is not discovered or the findings are insufficient to account for the abdominal symptoms.

F. J. Tees

The Technique of Gall Bladder Surgery in the Presence Of Jaundice. Crile, G. W.: Surg., Gynæc. and Obstet., November, 1921, vol. 33, page 469.

The author first points out that the great risk in these operations on jaundiced patients is from exhaustion. He discusses the physiology and pathology of the liver cells, impairment of which brings about a corresponding impairment of the brain cells and other vital organs. He advises the use of nitrous oxide anæsthesia, combined with local anæsthesia, because nitrous oxide interferes the least and only temporarily with internal respiration, while with chloroform and ether on account of their lipoid solvent effect on the cell structure, the interference with internal respiration is prolonged.

Blood transfusion is employed before and after operation because it promotes the oxygenation of the cells. Saline infusions are employed before and after operation to aid in maintaining the water equilibrium and acid-alkali balance. In grave cases, if possible, the operation is divided into two stages, the first stage only to relieve the biliary obstruction, delaying the ultimate operation until the stability of the brain and liver cells has been established.

Hot packs are applied over the entire liver region immediately after operation and are continued intermittently until after convalescence is established, because the internal repiration is promoted by heat and depressed by cooling of the liver cells. Narcotics, especially morphia, are contra-indicated both before and after operation, because the function of the liver already impaired by disease is further depressed by narcotics.

B. F. McNaughton

Fragilitas Ossium. Van der Veer, E. A., and Dickinson, A. M.: Ann. Surg., November, 1921, vol. 74, page 629.

The authors report in detail the case of a boy of eleven suffering with this disease as a result of which fracture of one or other femur occurred fifteen times. The disease is a relatively rare condition and is accompanied by blue sclera. The etiology is unknown in the large majority of cases. Heredity seems to be a factor in less than ten per cent. of the cases. There is no demonstrable relationship between it and other bone conditions, such as scurvy, tuberculosis, syphilis, osteomalacia, etc. The treatment is very unsatisfactory, and offers no hope of a cure. A brief bibliography of recent articles is added.

F. J. Tees

Orthopædic Surgery. Tubby, A. H.: Practitioner, December, 1921.

In the first part of this paper the author discusses the well-known views of Putti of Bologna concerning arthoplasty, and speaks of the end results seen by him personally at Putti's clinic.

The second part deals with the treatment of arthritis deformans of the hip. In connection with this distressing condition Tubby speaks favourably of the results obtained by weight-extension to the affected leg, to diminish friction within the hip joint. After a few weeks the patient is allowed up on crutches, wearing a Thomas brace to maintain traction. The sound leg is lengthened by a patten. Still later, walking without crutches is permitted, the affected leg, however, bearing no weight as this is taken by the pelvic ring of the brace. A joint which locks at the knee permits the patient to sit with comfort. In many cases this form of treatment has been of great benefit. J. A. Nutter

Non-union of Fracture of the Lower Third of Tibia. Eliason, E. L.: Surg., Gynæc. and Obstet., November, 1921, vol. 33, page 551.

In non-union of fracture of the tibia a large proportion occurs in the lower third. The author discusses the anatomy of the parts, noting particularly the relations of the arterial supply of the soft tissues overlying the lower third of the tibia, as also the nutrient artery supply to the bone.

He has performed a number of experiments on dogs, seeking to prove or disprove the effects of injury to the anterior tibial artery in the lower third. Clinically, he has observed in a series of cases with non-union: (a) that the foot of the affected limb is cooler than that of the normal side; (b) that the blood pressure in the dorsalis pedis artery is lowered, especially when the limb has been elevated for a prolonged period.

He concludes (a) that non-union is due to a lessening of the blood supply to the lower fragment either through interference with the nutrient artery or by trauma to the anterior tibial artery and its branches; (b) that the injured limb should be lowered from the elevated position as early as possible because the blood pressure in the terminal circulation is less affected in this position; (c) reduction of the fracture should be accomplished with the least possible trauma because of the danger of injuring the anterior tibial artery. B. F. McNaughton

On the Traumatology of the Sesamoid Structures. Bizarro, A. H.: Ann. of Surg., December 1921, vol. 74, page 783.

The results of anatomical, morphologic, and radiologic investigations bearing on the frequency of occurrence of the various sesamoid structures are detailed. These are divided into supernumerary bones and sesamoids. With the former are included those that have a well-defined morphological ancestry, and with the latter the fibrous, cartilaginous, or osseous elements seen in the human limbs in the neighborhood of the joints, excluding pathological findings. Fracture of the sesamoid bones was observed much earlier in animals than in man. Youatt's case (1866) is referred to, where a galloping horse fell, as if shot, due to this injury. The first case described in man was by Shunke (1901), since when many others have been reported, the hallux metatarso-phalangeal sesamoids being the ones chiefly concerned, and of these the lateral bone in nearly every instance.

The mechanism is discussed. Clinically, there is a history of trauma, followed by some local swelling, pain and tenderness on walking, pressing the metatarsal head, or moving the toe. Diagnosis is aided by x-ray examination, bearing in mind the possibility of congenital division, the degree of separation of the fragments, the unilaterality and the irregularity of the line of division are the most important guides. Treatment consists in rest at first, plaster, and later massage. The metatarsal bar (Jones) is of great value. Removal is advocated by some if the symptoms persist. F. J. Tees

UROLOGY

The Action of Various Drugs on the Gonococcus. Swartz, Ernest O., and Davis, David M.: Jour. of Urology, March, 1921, vol. 5, No. 3, page 235.

The authors have developed a method for testing the germicidal activity of drugs against the gonococcus, with which they have performed a series of experiments, using a number of drugs commonly employed in the prophylaxis and treatment of gonorrhœa.

They have suggested a factor indicating roughly the probable usefulness of germicidal drugs. This factor is obtained by dividing the concentration in which the drug will kill gonococci in twenty minutes, by the concentration in which it may be used in the urethra. There is a doubt as to the exact relationship between this factor and the therapeutic value of the drug. Silver compounds have large factors, due to the great concentration in which they may be used without irritating. They conclude from their experiments in vitro, that silvol, cargentos, argyrol and protargol have a definite but not very high germicidal value against the gonococcus. Phenol, potassium permanganate, zinc sulphate and boric acid have too little germicidal value against the gonococcus to be useful. Potassium mercuric iodide has a very high germicidal value against the gonococcus, which, in conjunction with its property of not precipitating protein should earn for it serious consideration and clinical investigation. It kills in vitro at 1-40,000, and may be used in the urethra to 1-200. Its germicidal activity is inferior only to a few new drugs of the mercurochrome series. F. S. Patch

Sacral Anæsthesia in Urology. Scholl, Albert J., Jr.: Jour. of Urology, vol. 6, page 149, August, 1921.

The writer points out that a correct administration of the anæsthesia for any type of case requires a study of the sacral foramina, the ligaments, and the pelvic landmarks. The structure of the sacrum is especially suited to nerve blocking, owing to the fact that all the foramina open into the main central canal, and fluid introduced through any of the openings will reach most of the sacral nerves.

Technique of sacral injection: The patient is placed face downward, with the hips elevated on a pillow. The horizontal position permits the most effective effusion of the fluid throughout the entire canal and some of the fluid escapes through the anterior foramina, and saturates the sacral plexus, which is on the anterior surface of the bone.

The sacral hiatus is palpated and a small intradermal wheal of novocain is infiltrated over the opening, through which a thin spinal puncture needle is introduced. The needle passes through the skin and sacro-coccygeal ligament at right angles, piercing the ligament about 0.5 cm. below the apex of the triangle. The shoulder of the needle is then lowered until the shaft is parallel to the sacral canal. The needle is gently insinuated along the canal for a distance of 4 cm. to 5 c.m. About 30 cc. of 2 per cent. novocain solution (to which has been added .006 per cent. adrenalin and 0.5 per cent. sodium bicarbonate) is injected, the needle being slowly withdrawn during the latter part of the injection.

The author considers it possible to enter practically any sacral canal, except those showing abnormalities such as ossified membranes, extreme curvature of the lower sacral segments, very narrow sacral canal or canals obstructed by tumours. The dangers arising are due to piercing a sacral nerve, a sacral vein, or entering the dural sac. The two latter complications can be avoided by withdrawing the stylet, and waiting for the appearance of blood or spinal fluid.

Anæsthesia occurs in about four minutes in the ano-scrotal region, and radiates from this area, reaching its maximum in twenty to twenty-five minutes. It then covers laterally 10 cm. to 12 cm. on the inner surface of the thighs; posteriorly there is complete relaxation of the sphincter and with an area of anæsthesia covering the sacrum and buttocks; anteriorly the anterior urethra, the meatus, internal sphincters and the bladder are the last anæsthetized.

In the Mayo Clinic the writer used sacral anæsthesia in one hundred and fifty cases, of which one hundred and forty were successful. The failures were due to faulty technique, and in one case to a malignant growth in the sacral canal. This method of anæsthesia was very successful in irritable, inflamed, contracted bladders, permitting distension from 100 cc. to 150 cc. without a tendency to discharge The anæsthesia was satisfactory for cystoscopic examinations, fulguration of bladder tumours, the application of radium needles for malignant prostates, and lithopaxy with the Bigelow evacuation. The after effects were rare, only noted in five cases, such as headache and nausea, with slight cyanosis and pain at the site of injection. W. G. HEPBURN

RADIOLOGY

A Study of Eighteen Cases of Epithelioma of the Penis.

SCHREINER, R. F., AND KRESS, C.: Jour. of Radiology, October, 1921, vol. 2, No. 9, page 31.

IT is stated that cancer of the penis, one of the oldest known neoplasms, comprising 1 per cent. to 3 per cent. of all cancer cases in the male, can be healed by x-ray, when local in character and when recognized early.

The most common site for epithelioma of the penis is on the glans or the prepuce: metastases occur in the inguinal region and in the pelvic nodes. After analysis of results in the eighteen cases reported, the following treatment is advocated: (1) Filtered x-ray treatment of both groins; (2) unfiltered x-ray of from two to three times the erythema dose on the local lesion. A. S. KIRKLAND

A Symposium of Observations on Radiotherapy.

POYNTZ. L. K.: Jour of Radiology, October, 1921, vol. 2, page2.

INTERESTING observations relative to deep x-ray therapy, as used in German clinics, are advanced in orderly fashion under various headings, viz.: Apparatus. dosage, filtration, conditions treated.

Various clinics are using a variety of machines with a similar principle, consisting of two coils with the primaries and secondaries in series. The line leads directly from a resistance into the primary of one coil, then through an interrupter into the primary of the second coil, through the balance of the resistance and so completes the circuit on the primary side. The secondary windings are connected in series through a vacuum valve which "holds up" the increasing potential until the pent-up energy bursts through at a very high and almost constant voltage.

These models are built to activate from one to four tubes and supply a current of 3 M.A. at 240 Kv., which is equal to a 40 cm. gap. Later models have the tube enclosed in a grounded lead compartment which is fixed. The patient is, therefore, adjusted to the tube rather than the tube to the patient. Several ingenious additions to this apparatus are described, notably the oscillograph, which depicts on a revolving drum the behaviour of the tube in action. The tubes in most common use were the Mueller Boiling tube and the Coolidge Furstenau tube.

Several instruments have been devised to estimate dosage; the Iontonquintometer impressed the author most favourably. By using this instrument associated with biological tests, the erythema dose, as delivered by a certain tube under fixed conditions, has been recorded. This tube is now used to standardize all treatment tubes at the clinic at Erlangen.

Aluminum, zinc, copper, gold, celluloid and shoe leather are used for filtration. It is claimed that 1 mm. of copper is equivalent to 17 to 19 mm. of aluminum

Distance from target to skin varies from 23 cm. for deep conditions to 70 cm. and 100 cm. for carcinoma of the breast. The time of exposure has been greatly increased, extending at times from six to fifteen hours. These long treatments with terrific dosage frequently provoke roentgen sickness with nausea and vomiting, which symptoms are combated by hypodermic injection of morphine and scopolamin, and thorough ventilation of treatment rooms. Associated with vomiting, the patient after such a treatment as the "Roentgen Wertheim" may have bloody and mucoid diarrhœa and marked blood changes. Blood transfusion is frequently necessary and is a routine in asthenic cases.

As an example in dosage as used in the "Roentgen Wertheim" treatment for carcinoma of the uterus, the following is interesting: 40 minutes with 3 M.A. of current, 0.5 mm. of copper and 1 mm. of aluminum at 23 cm. over each of 18 areas divided into three seances, at each of which six areas are treated, six weeks elapsing between each seance.

Having noted that the canceride dose is estimated at 110 per cent. of the skin unit dose and that the sarcoma dose is 60 per cent. to 70 per cent. of the U.S.D., the article touches briefly on x-ray therapy of pulmonary tuberculosis and of blood and uræmic conditions.

A. S. KIRKLAND

Some Theoretical and Some Practical Aspects of Psychoanalysis.

MILLS, C. K., M.D., LL.D.,: Arch. Neurol. and Psychiatry, December, 1921.

MILLS begins with the question, "Is psychanalysis a form of mysticism or semi-mysticism?" and claims that Jung and other psychanalysts show themselves disciples of the occult in their fantastic interpretations in symbolism and dreams, and makes much of the divergence of views of Freud, Jung, Ernest Jones, and others. He suggests that Adler's special theory of organ inferiority and psychic compensation has been developed as a kind of defensive reaction against being considered a mystic himself. Mills also notes a tendency among psychanalysts to be carried away by their sexual and mystical theories and to ignore the co-relations which have been established during the last fifty years through anatomical, physiological and pathological investigations between structural alteration and brain function.

With regard to Kempf's work on Psychopathology, Mills says, one gets the impression that in emotion and sexuality the personality is entirely dominated by the segmental visceral system, that for Kempf the mind is resident in the spino-visceral segments of the nervous system. Being a Freudian, Kempf of course lays tremendous stress on the sexual element in the analysis of cases." Again, "like most Freudians he is suggestionally fascinated with his views of psychology and psychiatry. Sex is glaringly exhibited to him on every psychiatric canvas."

Mills ridicules "the manner in which the psychanalyst reads into any subject the ideas which for the time being are dominating his personality," and "voluminous terminology," but most of all the Freudian sexual theory, devoting special attention to the Oedipus complex.

Mills does not believe in the "latent dream thought" theory of Freud, and suggests that it is "an invention of the analyst to enable him to escape from the diffic in proving his sexual theory" He considers that the method employed in psychanalysis is a stimulus not only to the imagination of the patient, but also to fabrication.

He alludes to the studies of war-neuroses, in which the sexual element played an almost negligible role, and cites the success of treatment by means of rest and suggestion as evidence against Freudian and Jungian theories of the neuroses and their treatment by psychanalysis.

Lastly, he considers the evils and dangers of psychanalysis, classing them among those arising from too intense concentration on mystic or semi-mystic subjects such as spiritism, christian science, divine healing, and the therapy of shrines such as St. Anne de Beaupre; concluding with the prediction that psychanalysis, especially the Freudian or sexual variety, in another generation will have lost its hold on the community.

The article is entertaining to read, but cannot be taken seriously, the writer's criticisms being evidently marred by prejudice.

A. G. Morphy

A Critique of Psychanalysis Prince, M.: Arch. Neurol. and Psychiat., December, 1921.

In contrast to Dr. Mills' argument of ridicule, Dr. Prince discusses psychanalysis from a more impartial viewpoint. The method of free associations, he says, is of unquestionable value for the purpose of digging into the mind; and is a distinct addition to our diagnostic technique, but it has its limitations and fallacies, and he reminds us that errors may attend diagnostic technique even in physical conditions.

Prince finds a logical vicious circle in the assumption of various theoretical mechanisms such as conflict, repression, displacement, compromise and numerous others having been "proved by free associations," and then used to prove as determinants the selected associations in the psychanalysis of a given case.

In the hands of unbiased and experienced clinicians, psychanalysis is capable of giving valuable results, provided those results are not dependent on interpretation through hypothetical concepts and doctrines of questionable nature.

Two theoretical principles, however, for which we are indebted to the genius of Freud, must be accepted as contributions of the highest importance to our knowledge, namely, repression and conflict. The theory of the subconscious was not originated by Freud, but dates back as far as Leibnitz and Kant. While Janet and others worked out the clinical phenomena due to dissociation with the formation of subconscious processes, Freud discovered and applied the principle and mechanism of repression to explain dissociation. Even though we may not accept Freud's doctrine of the repressed sexual wish as to the motive force or urge, we must give him the credit that the basis of his investigation was the search for the "why." Prince then discusses the various theories of the nature and existence of the unconscious, pointing out their fallacies as he sees them, also "libido" and symbolisms.

In conclusion he credits Freud with having compelled psychologists to take heed to dynamic and functional processes, and although the Freudian doctrine of the repressed sexual wish as the universal determinant of the psychoneuroses broke down as a result of war experiences, psychologists and psychiatrists generally recognize that the explanation of the psychoneuroses is to be found in the conflicting instinctive attitudes, strivings, impulses and reactions of human personality.

A. G. Morphy

Artificial Pneumorachis in Treatment of Acute Infections of the Meninges. Sharp Arch of Neurol and Psychiat, Vol 6, 669, December, 1921.

In a preliminary report the author discusses the advantages of the injection of oxygen or air into the subarachnoid space by means of lumbar puncture, as a therapeutic measure in the treatment of acute infections of the meninges.

He shows that in such cases as occur in every epidemic, where the spinal fluid is obtained with difficulty, the injection of oxygen permits of a freer flow of fluid and when repeated is followed by a similar, more abundant evacuation of the purulent spinal fluid.

He points out that the effect of this measure may be a mechanical one, only, in opening up secluded pockets of adhesions and replacing the confined fluid. On the other hand the known fact that different gases are absorbed at varying intervals of time, suggests that some therapeutic benefit may result from the absorption of the gas alone. He cites 12 cases of tuberculous meningitis, of which 3 recovered and remained perfectly well for an interval of one year or more.

It is pointed out, however, that in these three cases, the diagnosis was made on the clinical findings, including examination of the spinal fluid (clear fluid, increased lymphocyte count, increased glubolin content, increased pressure, formation of fibrin pellicle on standing and a negative Wassermann reaction) but lacking the positive evidence of tubercle bacilli in the fluid. The additional evidence of tuberculous foci in other parts of the body bears out the diagnosis. It is significant, however, that none of the cases showing the presence of tubercle bacilli in the spinal fluid recovered , although temporary improvement was noted in some of the cases.

No ill effects were observed, following the operation. The method is applicable to all cases of spinal infection where the meninges are involved, and the series of 64 cases, treated by the author, includes meningitis of meningococcic, pneumococcic, streptococcic, typhoidal and tuberculous origin, lethargic encephalitis and poliomyelitis.

The examination of the cranium by x-ray, following the injection, shows the presence of gas over the cerebral cortex, in the subarachnoid space and cysterna magna, evidence that the gas actually reaches the ventricles.

The technique consists in the ordinary lumbar puncture, when as much fluid as will flow is allowed to escape. The oxygen is then injected by means of a 20 cc.. Luer syringe. The syringe is filled by allowing the pressure from the oxygen tank to force back the piston and injected slowly, using 5 to 10 c.c. of the gas. The removal of the syringe allows the gas and fluid to escape in a frothy mixture. Reinjection results in additional fluid escaping when the syringe is removed.

F. H. Mackay

Vaccine Treatment of Asthma. Vickett, Carley and Connell: Mich. State Med. Soc Jour., August 20, 1921.

Considering bronchial asthma in many cases to be the sequel of focal infections, the writers in all cases examine carefully the tonsils and accessory sinuses. If any local disease is found it is treated by the ordinary method. after a vaccine is made from cultures derived from the infected area. If no foci are found a vaccine is made from the sputum The vaccines are prepared in the strength of 200,000,000 millions of organisms per cubic centimeter. It is well to begin with a small dose and gradually increase with each succeeding weekly inoculation

A. H. MacCordick

Subacute Bacterial Endocarditis. Mayo, Frank D.: Edin. Med Jour., September 27, 1921.

The onset is usually insidious, with gradually increasing debility. It is only when the disease is well established that endocardial lesions are demonstrable. There is mild remittent fever with a progressive secondary anæmia and variable leucocytosis. There may be occasional joint pains with moderate periarticular swelling. The myocardium is little affected, thus the rhythm remains normal. The most serious consequences are due to infected emboli and thrombi, involving the cerebral and other arteries. The author warns against considering as inconsequential an organic mitral lesion even in the presence of a normal myocardium. The isolation of the organisms is difficult. The prognosis, if not grave, is not encouraging, and the treatment is unsatisfactory.

A. H. MacCordick

The Significance of Biologic Reactions in Syphilis of the Central Nervous System. Kaliski and Strauss: Arch. of Neurol. and Psychiat., January, 1922.

This paper is based on the treatment of more than 500 cases by all methods of therapy. About 400 cases received the Swift-Ellis method of treatment, and some have received as many as 40 intraspinal injections.

The conclusions of the authors are very much against the use of intraspinal treatment except in very rare incidents. They feel that as good or better results can be obtained by the intravenous method alone, using moderate doses of arsphenamine, given intravenously every 3 to 7 days, with mercury intramuscularly. This method, they claim, is just as efficacious as intraspinal without the danger of the latter treatment.

G. S. Mundie

The Prognosis of Involution Melancholia. Hoch and MacCurdy: Arch. of Neur. and Psychiat., January, 1922.

Hoch, before his death, had begun a study of this problem. In the present paper, MacCurdy analyzes sixty-seven patients suffering from this disease, and compares his results with that of Dreyfus, whose work appeared in 1907. It is not necessary to discuss the symptoms and differential diagnosis of this disease. A summary of this paper is, however, interesting. It is as follows:

The results in a series of sixty-seven patients (summarized in Table 4, pp. 18-37) in whom the final outcome was determined in all but one case, cause us to conclude that patients with involution melancholia recover unless they show as dominant symptoms: marked insufficiency of affect, peevish or auto-erotic behaviour, or ridiculous hypochondriac delusions which usually are concerned with the alimentary tract. These prognostically bad symptoms may be present for a short phase of the psychosis in women at the menopause without their prejudicing the outlook for recovery. All patients who eventually recover show some improvement within four years after the onset. The others run a chronic course or die unimproved.

G. S. Mundie

DERMATOLOGY

The Application of Cutaneous Sensitization to Diseases of the Skin. Engman, M. F., and Warner, W. G.: Arch. of Derm. and Syph., 1921, vol. 3, page 223.

Such skin affections as urtiacaria, eczema, pemphigus, dermatitis, herpetiformis and erythema mutiforme are dealt with in relation to the cutaneous reactions of various proteins both food and bacterial, as well as certain pollens. Small incisions one-eighth inch long and about one inch apart are made on the forearm, previous cleaning of the surface being omitted owing to the tendency of such friction on sensitive skins to mask the local reaction

A drop of sodium hydroxide (1-10 normal solution) is placed on the incision and a minute quantity of the protein to be tested immediately added. The full reaction shows itself in from a few minutes to half an hour. Their series showed positive results as follows: Urticaria 79 per cent., infantile eczema 78 per cent., chronic generalized eczema 38 per cent In the other conditions mentioned the percentage was negligible. The writers believe the tests to be of great value both diagnostically and therapeutically as they found that in such cases where the diet could be controlled so as to exclude the offending protein, excellent results followed, and that when desensitization was possible a diet containing such protein might be resumed.

P. Burnett

Ringworm of the Nails. Hodges, Robert S.: Arch. Dermat. and Syph., July, 1921.

It is pointed out that ringworm of the nails (onychomycosis) is more prevalent than generally recognized. The causative fungus is a large spored ectothrix tricophyton, three varieties of which are described The epidermophyton which is responsible for tinea cruris and other eruptions on the hands and feet does not attack the hair or nails.

He strongly recommends the use of Whitfield's ointment in this affection, having found great benefit from a personal experience of ringworm of the nails of long years' standing.' The ointment consists of: benzoic acid, 4 parts; salicylic acid, 2 parts; petrolatum, 30 parts.

H. E. MacDermott

The Infective Origin of Anogenital Pruritus. Winfield, J. M.: Arch. of Dermat. and Syph., November, 1921.

In a series of 50 cases of this affection, it was found that most of the patients had an infection of the skin in the affected area, caused either by B. coli or streptococcus fæcalis, or by both. Treatment by auto vaccine gave cure or relief in 90 per cent. of cases.

H. E. MacDermott

Treatment of Psoriasis. Sutton, R. L.: Arch. of Dermat. and Syph., November, 1921.

He uses an autogenous colon vaccine, combined with a liberal supply of chrysarobin (20 per cent.) with the addition of arsenic, internally in the later stages. The vaccine is given by starting with 1-10 c.c. of a suspension of 1000 million to the c.c., increasing 20 per cent. every second or third day, till a reaction is obtained, and when this has subsided the treatment is repeated. The treatment is only followed in cases where the general condition of the patient is good, and the disease is in the quiescent stage.

H. E. MacDermott

PEDIATRICS

Exanthem Subitum. Veeder, B. S., and Hempelmann, F. C.; Jour. Amer. Med. Assoc., December 3, 1921.

Under this title an attempt is made to establish a previously unrecognized disease of infants. The condition is apparently not contagious and chiefly affects children between the ages of six and eighteen months. The essential characteristics are an abrupt onset with high fever lasting two or three days. On the fourth day the temperature falls to normal by crisis and coincidently a rash appears over the trunk, neck and extremities. The eruption is maculo-papular, closely resembling that of rubella, and fades in one or two days. The post-cervical glands are not enlarged, there are no catarrhal symptoms and no angina. The blood shews a leucopenia with relative lymphocytosis. In no instance was there a second case in the family or a second attack in the same child. The authors discuss the differential diagnosis from measles, scarlet fever, and rubella.

H. B. Cushing

Convalescent Serum from Measles as Prophylaxis. ZSCHAU Munch Wochenschr., August 19, 1921.

THE author gives his experience in injecting 37 children who had been exposed to measles with serum collected from convalescent patients, in an attempt to prevent the development of the disease.

The serum was collected from children of 3 to 9 years, during the second week of convalescence, that is, usually between the eleventh and seventeenth day after the appearance of the rash. When possible the sera from several children were mixed. The usual dose given was about 10 cc, administered as soon as possible after exposure to infection. He concludes that the immune serum gives almost complete protection for three or four weeks. In the few cases where measles did develop the attack was very slight, with almost no constitutional disturbance. A similar method was tried in a few cases exposed to varicella with complete failure, no immunity to the disease being produced. H. B. CUSHING

News Items

ONTARIO

THE official opening of the new Western University Medical School Building at London, Ontario, was held on November 17th and 18th. The building had been open at certain periods during the two preceding days for public inspection, when a considerable number of the citizens of London took advantage of the opportunity to become more familiar with the work which the Western University is doing for medical education in Western Ontario.

On Thursday, November 17th, the opening exercises included an address given by the Hon. R. H. Grant, Minister of Education for Ontario, and the unveiling of a portrait of the late Dr. Hugh A. McCallum, who was for some years Dean of the Western University Medical School. Mr. Grant congratulated the people of London and Western Ontario for the efforts which they had made to assist in the erection and equipment of the new building, and reiterated his belief in the importance of the work which the Western University Medical School has already accomplished, and which it is now prepared to do more efficiently. These exercises, at which the Hon. W. J. Roche, M.D., LL.D., Chancellor of the Western University, presided, were held in the auditorium of the new building, which was well filled with students, citizens of London and other friends of the Medical School.

On Friday, November 18th, Professor A. B. Macallum, M.A., M.B., Ph.D., Sc.D., LL.D., F.R.S., Professor of Biochemistry at McGill University, delivered the opening address to the faculty, students and alumni. He recalled the early history of the school, with which as a former citizen of Middlesex County he was thoroughly familiar, and spoke in glowing terms of those men whose keen interest in their profession had led to the founding of the Medical Faculty of the Western University. In the latter part of his address Dr. Macallum emphasized the importance of the position which research must take in the work of the modern medical school, and exhorted his hearers to greater activity along the lines of endeavour which will add to the efficiency with which the science of medicine serves mankind.

The exercises of the week were brought to a close with a reception given by the Board of Governors and Faculty of Medicine on Friday evening.

The new building makes its appeal not by unique or elaborate architecture and finish, but by the simplicity and efficiency of its arrangement It is laid out in units which are independent as to plumbing, wiring, etc. These units are for pathology and bacteriology, histology and embryology, library and office, biochemistry, pharmacology, physiology and anatomy. The animal house is located on the roof and a well-equipped shop for work in both wood and metal is found in the basement, with a full timed trained shop man in charge. There is a gymnasium for students. The teaching laboratories are planned for the accommodation of classes of sixty. In addition to these laboratories, an office and private laboratory is provided for each professor, as well as rooms for assistants and others engaging in research.

The new building with its equipment represents an outlay of about half a million dollars, and is now occupied by a well-trained staff whose efforts will be directed not only to the proper instruction of medical students but also to investigations leading to the advancement of medical science in Canada.

DURING January the following meetings were held at the Academy of Medicine, Toronto: January 3rd, stated meeting—Intestinal Obstruction, by Prof. L. J. Austin of Queen's University (by invitation). January 5th, a joint meeting of obstetrics, gynæcology and state medicine. January 9th, section of opthalmology and oto-laryngology. January 10th, section of medicine. January 17th, section of surgery. January 19th, section of pædiatrics. January 24th, section of pathology. January 31st, a special meeting was held for the presentation and unveiling of the tablet commemorating the service overseas of Fellows of the Academy. The splendid portrait of Dr. J. A. Temple, painted by Mr. Austin Shaw and presented to him by the graduates of Trinity Medical College, has been given the Academy by Dr. Temple. The formal presentation took place on January 31st.

DISTRICT Number Seven of the Ontario Medical Association, comprising the Counties of Frontenac, Lennox and Addington, Lanark, Leeds and Grenville, held its Annual Meeting in the Clinic Room, Kingston General Hospital on Monday, January 9th, 1922, the Counsellor of the District, Dr. H. A. Boyce, presiding. The afternoon session took the form of a clinic, the following cases being presented:—(a) Gout; (b) Molluscum Fibrosum—W. T. Connell, M.D, M.R.C.S.;Foreign body in the eye; Oesophageal Stricture—J. C. Connell, M.A., M.D.; Tendon and Bone Transplantation—D. E. Mundell, B.A, M.D.; (a) Tumour of Pituitary (b) Paranoia—E. Ryan, B.A., M.D.; (a) Musculo-Spiral Paralysis (b) Upper Motor Neuron Lesion (c) Tumour of Spinal Cord—L. J Austin, F.R.C.S.; Raynaud's Disease—R. Ferguson, M D. ;(a) Leukemia, (b) Luetic Aortitis—Wm. Gibson, M.D, ; Transposition of Viscera—X Ray Plates—J. F. Sparks, B.A., M.D.,; Acute Yellow Atrophy—J. Miller, M.D., F.R.C.P., E.,; Congenital Heart—H. E. Day, M D. An informal dinner was served at 7:30 P.M at the Frontenac Club, which was very well attended by the district practitioners. Following the dinner, short addresses were delivered by Dr F. J Farley of Trenton and Dr. T C. Routley of Toronto, President and Secretary, respectively, of the Ontario Medical Association. Professor G. Reed, Ph.D., of Queen's University, presented an illustrated address on "Some recent advances in the study of Filterable Viruses." The program throughout the day was practical, instructive and interesting, and the local Society of

Kingston, under whose auspices the meeting was held, are to be congratulated on the splendid manner in which all the arrangements were carried out.

SPECIAL ACADEMY MEETING

Programme for Thursday, Feb. 23rd, 1922 at 8:30 P.M. Address by Dr. Frederick H. Baetjer, Associate-Professor of Roentgenology, Johns Hopkins University; Roentgenologist, Johns Hopkins Hospital: Subject: Radiology of Diseases of Bone. During the afternoon of the same day at 2:30 P.M., the Ontario Radiological Society will hold a meeting to which all Fellows of the Academy are invited. The following papers will be given: 1 Classification of Pulmonary Tuberculosis from the X-Ray Standpoint—by Drs. C D. Parfitt and D W. Crombie of Calydor Sanitarium. 2. Radiological Diagnosis of Genito-urinary Conditions—Dr. L. R. Hess, Hamilton 3. Some Interesting Abdominal Conditions in Children—Dr. A. H. Rolph, Toronto.

NOVA SCOTIA

The first regular meeting of the Valley Medical Association for 1922 was held in Bridgetown on Friday, January 13, 1922. The membership of this Association is made up of the doctors of Kings, Annapolis and Digby counties. The society has had a creditable record and has been of great value to the public and to the profession in these three counties. In attendance were Dr. L. R. Morse. President, Dr. J. A. Sponagle, Secretary, and the following members: Drs G. J. McNally, P. N. Balcolm, W. F. Reid, M. E. Armstrong, D. E. A. DeWitt, M. R. Elliott, W. S. Phinney, T. H. MacDonald, A. A. Dechman and Stella Pearson; also the following as visitors: Dr. H. K. MacDonald, Halifax Medical Society; Dr. A. C. Jost, Public Health Department, Halifax, N. S.; Dr. S. L. Walker, D.S.C.R., Halifax, N.S.; Dr. D. A Craig, Massachusetts Health Commission, Halifax, N.S.

Besides routine business, the following papers were read and discussed: "Diagnosis of conditions regarding Tonsilectomy," Dr. W. S. Phinney, Lawrencetown, N.S.; "The Ethics of Organization," Dr. S. L. Walker, Halifax, N.S.; "Early Diagnosis of Cancer," Dr. H K. MacDonald, Halifax, N.S.; "Important points in the physical examination of the Chest," Dr. D. A Craig, Massachusetts Health Commission, Halifax, N.S.; "Vital Statistics," Dr A C. Jost, Provincial Health Inspector.

The Valley Medical Association is affiliated with the Nova Scotia Medical Society, and elected at its meeting as members of the provincial executive: Dr. W. F. Reid, Digby N.S., Dr. H. R. Elliott, Wolfville, N.S., and Dr. J. A. Sponagle, Middleton, N.S. The next meeting of the Association will be held in Wolfville.

QUEBEC

The annual meeting of the Canadian National Committee of Mental Hygiene will take place at the Ritz Carlton Hotel, Montreal, on February 17, 1922, at 4.30 p.m. The work of the Committee during the year will be reviewed and the results of the surveys made in the different provinces will be reported.

The Committee is peculiarly fortunate in having as a patroness of the occasion Her Excellency Lady Byng,, who will address the meeting. Her Excellency is greatly interested in the purpose which the committee is endeavouring to serve, and there is no doubt that the stimulus from her presence will add greatly to the interest of the meeting, as well to as the progress of the work. Sir Arthur Currie will also take part in the programme.

The committee is to be congratulated upon achieving results that are nothing short of marvellous during the three years of their existence, and the auspicious opening of a fourth year is a source of congratulation to all those who have assisted in the meetings. Hitherto the work has been carried on almost entirely through the generosity of individual citizens throughout the country. In many of the provinces, however, the government has realised the importance of the work and has given large grants for the purpose of establishing psychopathic hospitals and schools for those who are mentally deficient. It is hoped that in the near future the province of Quebec will also come under similar auspices, whereby the programme may be considerably extended.

MANITOBA

The new officers of the North-Western Manitoba Medical Association are as follows: President, Dr. George Clingan, M.L.A., Virden; Secretary-treasurer, Dr. M. C. O'Brien, Rossburn. Meetings are held once a month during the summer and autumn as long as the weather permits and the roads are passable. Although only started in 1917, the Association is very active, meeting at different points and securing in each place a public lecture on some important subject relating to the public health.

BRITISH COLUMBIA

The present and proposed activities of the British Columbia Medical Association are most encouraging. There is a strong feeling throughout the province that there has been too much apathy in the past and there is a keen desire on the part of the profession to get together and by sincere co-operation and individual effort promote anything and everything which may be of benefit to the profession as a whole. An intensive and extensive membership campaign has been particularly successful to date, and it it hoped that in the near future the complete unification of the profession will be accomplished A recent tour of the president, executive secretary and a member of the executive to the Kootenay and Okanagan centres resulted in the organization of a local society at Nelson, and at enthusiastic meetings at Kamloops, Vernon and Penticton an unanimous endorsation of the proposed activities was much appreciated by the visiting officers. Many new applications for membership were received. In Victoria, Vancouver and New Westminster the membership campaign has been highly satisfactory.

A committee is at present working on a scheme for a "public health" week. Meetings of an educational nature will be held in the principal cities and towns throughout the province. It is felt that there is a sincere desire on the part of the public to know more about the prevention of disease than the medical profession has vouchsafed them in the past, and that this may be a reason for the phenomenal growth of the illegal cults. Concerted action by the British Columbia Medical Association in this direction should be beneficial in regaining the confidence of the public. The question of medical contracts in this province has been a vexed one for some time, and immediate steps are being taken to have these put on a more satisfactory basis. Other matters of equal importance are in hand, particulars of which will be reported to the *Canadian Medical Association Journal* as they materialize.

The regular monthly meeting of the Vancouver Medical Association was held on December 12th, when Dr. H. C. Steeves of the New Westminster Insane Asylum read a paper on "The Physician's Responsibility in Connection with the Insane and Their Committal to Hospital, together with suggestions for the examination of the mental patient." A clinical meeeting of this society was also held during the month. The Vancouver Medical Association inaugurated an Osler lectureship last year, Dr. W. D. Keith having the honour of being the first lecturer. On January 9th, at a full meeting of the Association, Dr. J. M. Pearson gave the second Osler lecture "On the value of style as exemplified in the writings of Sir William Osler." This lecture created a very deep impression, and expression of admiration for the exponent. It is to be hoped that it will be published in the *Journal* in the near future.

The Fraser Valley Medical Association of British Columbia, which embraces the city of New Westminster and the lower Fraser valley, was after a number of years of inactivity revived and reorganized in September, 1920. Since that date it has held regular monthly meetings with almost one hundred per cent. attendance. The officers of this Association are: Dr. R. E. Walker as president, Dr. E. J. Rothwell vice-president, and Dr. G. S. Purvis secretary. At the December meeting Dr. A. W. Hunter, surgical pathologist of the Vancouver General Hospital, presented a paper on "The practical value of the laboratory to the general practitioner" which was much appreciated.

Dr. G. A. B. Hall, who has been chief medical referee of the Workmen's Compensation Board for the past five years, is severing his connection with that organization and will resume private practice in Nanaimo. He was the recipient of a presentation by the Board officials and the staff of a fully equipped medical bag, and a very warm tribute was paid to the valuable services that Dr. Hall had rendered in connection with the administration of the Workmen's Compensation Act.

At the well-babies' clinic held under the auspices of the South Vancouver branch of the V.O.N., Dr. George Lamont, school medical officer, was presented with a gold pencil and a gold clinical thermometer case by the mothers attending the clinic, as a slight acknowledgment of their appreciation of his work during the past year.

Obituary

DR. JOHN PARK

Dr. John Park, of Edmonton, died after a short illness on December 24, 1921. Born at Uxbridge, Ont., in 1851, he received a high school education in his own town. After spending several years as a teacher in the public schools he commenced the study of medicine in Trinity Medical College, Toronto, from which he graduated in 1883. After graduation he spent some years in practice in Ontario, but later on moved to the West and settled in Edmonton, in which city he soon rose in general esteem and held many honourable and important positions. For many years he was a member of the Alberta Medical Council, retiring from it on his appointment to the Registrarship of the College of Physicians and Surgeons, the duties of which he discharged with much success until his death. He also served for eleven years as member of the Board of Health, during the last two of which he acted as Chairman of the Board. For two years he was Medical Representative on the Senate of the University of Alberta, and for the first four years of its existence was an active member of the Medical Council of Canada. A few months ago he developed signs of a myocarditis, followed after a short interval by embolism, which proved the immediate cause of death Dr. Park was a man of strong personality and of the highest integrity of purpose and action.

DR. J. W. BURNETT

Dr. J. W. Burnett, of Sussex, N B., died suddenly on the evening of October 16th, while on a short walk through the woods in the neighbourhood of Chisholm Lake, N.B. His body was found in the woods in a sitting posture near a log. He was in his eighty-first year and was, with one exception, the senior medical practitioner in the province. For many years he conducted the Cottage Hospital in Sussex. He was widely known throughout Canada, and was highly respected by a large circle of friends.

DR. JAMES CARLYLE FYSHE

Dr. James Carlyle Fyshe died suddenly at Waterhole, Alberta, on December 6th. He was the eldest son of Mr. Thomas Fyshe, general manager of the Merchants Bank. He spent some years in Siam, where he held the post of Assistant Medical Officer of Health at Bangkok. Returning to Canada he was appointed superintendent of the Montreal General Hospital, but resigned it shortly to accept the position of Superintendent of the Civic Hospital in Edmonton. He went overseas with the Alberta Dragoons, and served in France and in England till the close of the war. His wife and one son survive him.

DR. ALLAN BAINES

Dr. Allan Baines died in Toronto on the 12th of January, after a long illness. It is hoped that the *Journal* will be able to reproduce an account of his interesting life and activities, as Dr. Baines was one of the last of the old school teachers, actively engaged in his work up to two years ago.

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Book Reviews

"The Evolution of Disease," with a Discussion of the Immune Reactions Occurring in Infectious and Non-Infectious Diseases: a Therapy of Immunity, of Anaphylaxis, and of Antianaphylaxis. Prof. J. Danysz, Institut Pasteur, Paris; translated by Francis M. Rackemann, M.D., Massachusetts General Hospital, Boston, Mass. Philadelphia and New York: Lea & Febiger, 1921.

In this small book the author has developed his theories of the evolution of acute and chronic infectious diseases. The work is divided into two parts. In the first part are discussed the theories of immunity and the investigations which have been stimulated by these theories.

Chapter II deals with physico-chemical propertiesand transformations which certain organic chemical compounds undergo—in vitro and in vivo. Next, the evolution of certain infectious diseases is specifically dealt with. Following this, the mechanism of infection, of immunity and anaphylaxis and the influence of the central nervous system on immunizing reactions and on anaphylaxis are elucidated. Therapeutic measures are discussed in Chapter VII. Then follows a statement of principles on which are based a classification of infectious diseases.

Part II consists of a further consideration of the evolution of theories of immunity, anaphylaxis and antianaphylaxis. In Chapter XI the principles on which the author bases his so-called antianaphylactic treatment of chronic diseases by entro-antigens is outlined. Whether or not one is prepared to accept all the conclusions arrived at by the author of this little book, it will be found a very stimulating and interesting survey of certain aspects of the field of immunity and anaphylaxis.

This book should also (as the translator points out) be of interest to those who recognize the importance of a comprehension of the principles underlying the study and treatment of disease. J. G. F.

Medical Electricity, Roentgen Rays and Radium. This is the third edition of a work which is now regarded as a classic work of reference, particularly uponthe application of electricity to medical uses.

The first part of the book is taken up with a very full description of electric currents, their physiological effects and modes of application and measurement. As a reference work this is invaluable, but is rather too full for general reading.

There is a much-needed chapter on Photo therapy, giving a very practical exposition of this subject in compact form. This chapter provides the general reader with most of the information he requires upon the subject while at the same time the special worker may find sufficient detail to enable him to apply the methods described.

The remainder of the book is taken up with *x*-rays and radium, these chapters having been brought up to date. Much of this matter is now of historic interest, as instanced by the colour plates of gas tubes in operation. No one now judges the condition of the gas by its colour even if he still uses one at all. There is, however, a great fund of information which is not equalled by any other book in English upon these subjects. The book will still find its chief field among those who seek special reading upon many of the scientific aspects of these various matters. G R

Surgical Anatomy. William Francis Campbell, M.D., Surgeon-in-Chief at Trinity Hospital, Brooklyn, N.Y.; sometime Professor of Anatomy and Professor of Surgery, Island College Hospital, Third edition, revised; 681 pages, with 325 original illustrations. W. B. Saunders Company, 1921, Philadelphia and London. Cloth, $6.50 net. Canadian agents, the J. F. Hartz Co., Limited, Toronto, Ont.

In this volume the author undertakes to present those facts of anatomy which are of practical utility in surgical work, and to estimate their clinical value. It may be stated that he has succeeded admirably and has produced a very readable book, a survey of which brings back to one's mind many points of importance.

At the same time one cannot but wonder as to the real value of works of this kind to the practical surgeon. It is obvious that enough anatomy cannot be described to form a solid foundation, and when surgical conclusions are based on a cursory consideration of the anatomic facts alone one is liable to be led into error. For instance, in speaking of tracheotomy the author says that it may be done "either above the isthmus of the thyroid—high tracheotomy—or below the isthmus—low tracheotomy—and that the former is to be preferred bacause of its simplicity." This teaching would certainly not be acceptable to Chevalier Jackson. Again in speaking of the perineal route for access to the prostate, he says: "The manifest advantages of this route in the accessibility of the prostate, the avoidance of an extensive wound of the floor of the bladder, render it the route of choice." Notwithstanding which Dr. Hugh Young of Baltimore is almost the only surgeon on this continent who does not advocate the supra-pubic route.

The book is well written, containing little or no padding, is well illustrated and well printed, and except for the inherent weakness noted above should prove of great value as an aid in mastering the essentials of practical anatomy. E. R. S.

Diseases of Children. Sheffield, Herman B., M.D., formerly Instructor in Diseases of Children, New York Post-Graduate Medical School and Hospital, and Medical Director Beth David Hospital; Consulting Physician to the Jewish Home for Convalescents and the East Side Clinic for Children. 779 pages, 238 illustrations and 9 colour plates. C. V. Mosby Company, St. Louis, 1921.

One can but regret that the writer's large experience should not have produced a better book. The ideas expressed are too frequently vague, the descriptions verbose and the arrangement and style poor. For these reasons the book is difficult to read. The illustrations are fairly well chosen and many are of value. A. B.

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SOME TENDENCIES IN MODERN CLINICAL MEDICINE*

C. F. Martin, M.D.

Professor of Medicine and Clinical Medicine, McGill University

PERHAPS no more striking evidence of the trend of ideas in Clinical Medicine is afforded than by a visit to a well-organized Department of Anatomy in which one finds the teaching directed not to anatomical details as such, not to nomenclature in all its frightfulness, but to the reasoning out of the functions of the various anatomical structures. In other words, function is the goal of anatomical knowledge. Hence it is in the daily demonstrations around the cadaver that one hears the almost parrot-like dissecting-room queries—What is this muscle or nerve for? What does it do? Pick up the muscle that bends the elbow—show me its nerve, etc. But the cadaver itself is used merely because dissection of the living man is obviously impracticable, and so the living subject is introduced and studied and the function of anatomical structure is explained with reference to motion, sensation and the like. In this way structure is associated with the body and its functions, and not with books.

As in anatomy, so in the teaching and study of clinical medicine. Throughout the entire field, one finds more and more attention being paid to the estimate of bodily functions in any clinical investigation of the different vital organs.

The attitude towards diseases of the heart, for instance, has in recent years undergone an almost epoch-making change. Every detail of the physical examination of the heart, important as it is, has now become of minor significance compared to the consideration of the organ as a whole. What can the heart do? What is it capable of enduring? How much is its reserve power? These are the questions that occupy the minds of physicians more than the question of morbid anatomical change *per se*. Less and less stress is being laid upon the size of the heart; its position, shape and outline. Not that these investigations are devoid of interest and importance and have their place in the complete examination of every individual; far from it, but they are of significance only insofar as they tell of bodily function. It is well recognized now that the size, position and shape of the heart are all so much determined by the type of the individual, the age, the sex and the posture, that variations within the normal are fairly wide. What matters it, after all, if the apex-beat be just outside the nipple line, if after exertion a man's pulse-rate is unaffected and his respirations unaltered; comparatively little, I would judge, though it, too, must count in the final estimate. We learn to speak of transverse hearts, long hearts, drop hearts, etc. as indicating not a cardiopathic condition per se, but merely a type of individual, just as we would speak of those who are robust or myasthenic in their conformation.

To a large extent, too, the appreciation of murmurs has undergone a considerable modification and their presence occupies a secondary role. Why indeed should it be otherwise when the victim of aortic disease for 25 years can ride his bicycle 60 miles a day without obvious harm. To-day our students are taught that the stethoscope comes fifth in importance and that in the scheme of investigation the history of symptoms is of prime practical importance. Insurance Companies have already long since learned that murmurs in themselves are not prohibitive of good insurance. Dependent as it is upon the condition of the myocardium, the function of the heart is largely estimated by those methods which can make clear its functional power. It is for this reason that stress must be laid most of all on two features of a cardiac examination. First, the history; and next, the electro-cardiogram. Thus it is that during convalescence, the weakness, the dyspnoea on exertion, the slight oedemas, are all expressions of myocardial involvement to a greater or less extent, and in fact, of the weakened functional power of the organ.

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*Abstract of lecture delivered before the Ottawa Medical Society.

Aschoff and others have demonstrated some years ago the early involvement of the myocardium in all acute infections. Hence the unusual care in modern times in examination of the heart after tonsillitis, the exanthemata, and indeed, in any acute infectious disease. These early manifestations of myocardial weakness find their more complete expression in the cardiac asthma, the winter bronchitis, and other signs of decompensation, when the myocardial degeneration has become pronounced. Green has admirably exposed the need for early recognition of myocardial disease to save the implicated muscle, and the means of its repair. It is in reference to this cardiac function that the electrocardiogram is becoming more and more important as an estimate of cardiac power, and not infrequently the inverted T. provides the only means of recognizing the possibility of impending death.

What applies to the heart is equally referable to the study of diseases of the kidney. Whereas in the past the anatomical lesions, as expressed in albuminuria and the presence of casts, were considered all important, to-day we recognise the functional power of the kidney as displayed by the quantity of day and night urine, by the variations of specific gravity in individual specimens, by the phenol sulphonephthalein test, and the urea and chloride contents of the blood, as the all-important means of studying diseases of the renal system. This point of view is too well recognized to need further mention here.

With reference to gastric diseases, clinicians and anatomists have come more and more to realise that the size, shape and position of the normal stomach may vary so widely that any standardization is well-nigh impossible. Function is the determining factor. The outline of the normal stomach varies according to sex, age and the conformation of the individual. Shape and size, tone and peristalsis are so greatly modified by changes in the stomach itself, and its relations to the surrounding viscera, that no one form can be described as typical. After all, the stomach is to be regarded as a living muscle and a highly-sensitive muscular organ, and as such it is constantly undergoing modifications determined by various factors; the quantity and quality of the contents; the period of the digestive process; the degree of development of the gastric musculature; the state of the adjacent viscera and the condition of the abdominal muscles. The stomachs of individuals, like their faces, conform to certain general types, but no two are quite alike. The position of the stomach in the abdomen is of no great importance except insofar as it affects function. Hence it is that, in its supposedly normal position, high in the abdomen, it may, when distended, produce pathological symptoms, either directly by raising the diaphragm, the heart and the pericardium, and thereby inducing irregularities of the pulse, dyspnoea and vasomotor disturbances, or indirectly by affecting the gastric plexus derived from the vagi and its associated sympathetic fibres, as well as the coronary plexus.

In another individual the organ may lie low in the pelvis without entailing any disturbance of its function, and to that extent it is a normal viscus. A gastroptosis—so-called—is in the first place much more common than is generally supposed, especially in women. To say of a man that he has gastroptosis is equivalent to saying, in most instances, that he is tall and thin; not enough stress is laid on habitus, i.e., the shape and build of the owners, in the consideration of gastric disease. The tall, thin man with gastroptosis as a rule manifests other signs which explain the low-lying organ, for generally in such patients not only is the stomach low but so also are the diaphragm and the heart, while the skeletal musculature is flabby; such a man is abnormal only insofar as he presents a type of myasthenia, one in whom atony of the gastric muscles and laxity of the ligaments accompany the other conditions. It should not be forgotten, too, that change of posture may alter the position of the stomach as much as five inches, a fact which explains the discrepancies found at the operating table on the one hand and under the fluorescent screen on the other.

Realizing, then, the relative unimportance of anatomical findings, attention has been centred more and more upon secretions and motor power, the two factors which determine gastric function.

With reference to secretions, the standards of normality have undergone a very striking revision. Thanks to the interesting observations of recent investigators, notably Rehfuss, with his fractional methods of analysis, it has become evident that normal gastric acidity varies within much wider limits than was previously suspected. The normal maximal total acidity has been raised from 60% to a possible 200%, while free hydrochloric acid may normally exceed the existing standards by double its quantity, these variations depending upon many simple factors; the amount of food; the period of digestion; the temperament of the individual, etc. Hence it is that the clinical significance of high acidity values has undergone a considerable change.

It has been suggested that the term "hyperacidity" be applied clinically only to such cases where the *symptoms* exist (burning sensations, pain and hunger, with relief after food, etc.) irrespective of the actual figures found on analysis. After all, hyperacidity is but an expression of some form of irritation which may be gastric or extra gastric. While it is associated in the minds of surgeons with irritation arising from three chief locations, viz., the gallbladder, appendix and stomach, it should not be forgotten that many other conditions may initiate similar irritations and consequent acidity. I refer to such conditions as tabes dorsalis, with its gastric crises; to migraine, with its intermittent hypersecretion, and often hyperacidity; to neuroses of various kinds, irrespective of organic disease.

Motility of the stomach has a very close relation to the degree of acidity, and it would seem that in various ways the two are dependent upon each other. The excessive peristalsis of the gastric muscle is in itself often an expression of the same kind of irritation which produces acidity, and high degrees of acidity are often associated with spasms to a very marked degree.

No satisfactory estimate of gastric function can be made without a consideration of the history of the symptoms, the degree of acidity and the motor power, and it is for this reason regrettable that Radiology has introduced into medicine one of the bugbears of modern clinical medicine, viz short cuts to diagnosis! The slavish adherence to *x*-Rays as the panacea for diagnosis in gastric disease and as a solution of all difficulties in diagnosis has given rise to not a little disappointment in this method of diagnosis. Surgeons and physicians alike have hitherto expected too much from radiology for the simple reason that too great dependence on one examination of this kind has often led to error. Is it any wonder, then, that cases of tabes and lead colic are not infrequently diagnosed after the *x*-Rays have failed to clear the doubt in diagnosis when a careful history of the case could easily have obviated the useless radiological examination?

Few experts in radiology regard their methods as anything else than accessory to diagnosis; an axiom that applies most of all to diseases of the alimentary tract. How often is one led astray by a single examination; or still more so, by a single plate, without the use of the fluorescent screen!

Certain cardinal rules should always be observed in examinations of gastric conditions by radiography:—

1.—Careful examination by the screen for at least 15 minutes after ingestion of the barium; this to be followed by serial plates.

2.—No diagnosis in doubtful cases should be made without repetition of the examination.

3.—The radiological report is to be considered only in conjunction with all other methods, including especially the careful history of the case.

According to the position and tone of the stomach, the peristaltic movements may give to the outline of the stomach almost any abnormal form, simulating hour-glass contracture, pyloric stenosis, etc. Certainly the *x*-Rays are no more a panacea for all diagnostic difficulties than is any other individual test by itself.

No area of the body affords more complexity in diagnosis than does the so-called region of surgical romance. I refer to the right hypochondrium, encroached upon, as it is, by so many of the abdominal viscera.

When one considers the variations that may occur in the radiograms through adhesions between any of these organs, one can more readily understand the surprises that come to the surgeon when he finds that, after all, the evidence was not sufficient to warrant an exploratory laparotomy. No one will deny, I think, that the tendency in modern days is to trust too much to this form of diagnosis to the exclusion of many other evidences which go to make up a complete clinical picture. There is no doubt that both physicians and surgeons are equally to blame. True it is that the over-cautious physician may be responsible for unnecessary delay in not recommending operation, and that an early cancer of the stomach and a long-suffering appendix may both develop dangerous symptoms because an exploratory laparotomy had not been done earlier; but in contrast to this is certainly the unnecessary rush to the operating table without full consideration of all the available tests, as well as proper appreciation of the habitus of the patient upon whom the operation is undertaken.

Let me not be misunderstood as denouncing rational surgery of the stomach, nor justifiable exploration. I merely wish to stress the point that, among the short cuts in diagnosis, these long incisions of unwarranted laparotomy are striking examples. Such a state of affairs, with its slavish adherence to the surgeon alone for diagnosis and treatment in dubious abdominal conditions, tends to a metamorphosis of the physician's office into a distributing agency for surgeons and specialists, and recalls to one's mind the medical services of the army, where the disposal of patients, rather than their complete diagnosis, was the main consideration of the time.

"MARROW PAINS" IN MALARIA AND IN CERTAIN OTHER ACUTE FEVERS

John Tait, M.D., D.Sc., F.R.S.E.

Professor of Physiology, McGill University

THE present article is an attempt with limited pathological knowledge and restricted clinical experience to handle a clinical problem from a point of view suggested originally by experimental laboratory findings.

During the war the writer was at one time engaged in treating malaria patients in Macedonia. It so happened that he had previously in conjunction with another worker been conducting a laboratory research on the fate of foreign particles injected into the blood stream (1). There appeared to be a relation between these experiments and the disease of malaria.

The results of the laboratory investigation may first be briefly recorded. When fine particles of Indian ink suspended in saline solution are injected in large amount into the blood-vessels of a rabbit, the black pigment mixing with the systemic blood at first discolours it (if the rabbit is an albino its eyes and mucous membranes become dark), but the discoloration rapidly disappears, and within the space of an hour or better, microscopic examination of films of the blood may fail to reveal a single particle of the black ink. The vascular apparatus evidently includes a mechanism for the prompt and effective removal of foreign matter.

When the injected animal is killed and opened up the greater part of its tissues appear absolutely clean of ink, so it is plain that the material has not adhered to the ordinary endothelium inside the vessels. The liver, however, is as black as coal. So is the spleen. The bony ribs show up through the chest wall conspicuously black in colour, and the thin cranial bones are similarly discoloured; when a long bone, such as the femur, is split open, the marrow comes out jet-black, the bone itself being free from pigment. As a rule, but perhaps not invariably, the pigment finds a lodging also in the lung and in the kidney. With the enumeration of the above five localities, liver, spleen, bone marrow, lung and kidney, the list of settling places is exhausted. The invariable absence of pigment in all the other organs is just as striking as its constant presence in liver, spleen and bone marrow.

When the pigment settles in lung and in kidney, microscopic examination reveals its presence as emboli plugging respectively pulmonary and glomerular capillaries; here it is collected by some process which is purely mechanical. In the other three organs, viz., liver, spleen and bone marrow, the pigment does not plug blood channels, but is ingested by cells lining the walls of the capillaries or sinusoids of the organ in question, the blood channels still remaining free. Consequently we conclude that the endothelium lining certain portions of the three organs, liver, spleen and bone marrow, differs from that of ordinary vessels in being phagocytic towards foreign particles.

A section of spleen shows a greater total proportion of pigment than one of similar thickness from either the marrow or the liver. The pigment is present only in that part of the splenic pulp which does not consist of lymphoid tissue, in other words it is absent from the Malpighian bodies just as it is absent from the trabeculae. In the liver the pigment is caught by the Kupffer cells, in the bone marrow by isolated cells lining the so-called "venous capillaries" (in reality sinusoids) of the tissue.

In malaria, a disease due to a parasitic infection of the blood, we know that granules of melanin pigment (from disintegrated erythrocytes) as well as the organisms of the disease, congregate in the liver, in the spleen and in the bone marrow. The spleen becomes enlarged, so also in many cases does the liver. The patient during a paroxysm suffers in addition from fairly severe pains, which may involve various regions of the body. On the assumption that these pains might originate in bone marrow, the author set himself the task of tabulating in a large number of cases the sites of the pains complained of by patients. Neglecting the occurrence of tenderness on pressure over the spleen and the frequent occurrence of epigastric or umbilical pain (provisionally classed as a referred pain), all the other pains of the disease were referable to regions containing bone marrow.

The most frequent pains of all, and present in all cases, are pain in the back (especially sacral and lumbar, though sometimes dorsal as well) and headache (back of eyes, frontal, vertical or occipital, as the case may be). Next in frequency are pains above and below the knee; then pains in the upper arm; more rarely in the lower part of the tibia and foot, or in forearm and wrist. Remarkably enough no case of costal pain was found, though in rare cases sternal pain was complained of. Pain in the cervical region was only once met with. Unlike the splenic tenderness, which is educed by pressure, and in marked contrast with the pains of trench fever, these particular pains were in no way aggravated either by locally applied pressure or by movement and exercise. This discovery seemed further to support the view that they are marrow pains. The only unilateral pain of malaria is the splenic tenderness; the "marrow pains" either involve the region of the axial skeleton or are symmetrically distributed in the limbs.

As a point of incidental interest it may be recorded that familiarity with the sites of malarial pain proved to be of value in differential diagnosis and in dealing with men who professed to have had recent attacks of malaria, one man after a purely verbal examination admitting that he had invented his symptoms.

The Indian ink experiments would appear to throw light upon some other organismal diseases besides malaria. When we encounter diseases in which post mortem examination reveals a simultaneous and massive phagocytic action on the part of the liver, of the spleen and of the bone marrow, we are enabled , arguing backwards, to say that the infecting organisms had reached these sites after being first of all free in the blood. Good examples are typhoid fever and kala azar. Current descriptions of the latter disease do not lay particular stress upon the site of such pains as may be associated with it, though such information would be of interest. To judge by the literature and by the author's own experience while in charge of cases in the Army, the pains of typhoid fever include "marrow pains." Still another disease of interest in this connection is small-pox, in which, while the presumable causative organism has not yet been identified, postmortem examination discloses necrotic areas in spleen, liver and bone marrow; in small-pox, even more than in typhoid fever, pain in the back and pain in the head are outstanding clinical features. Relapsing fever, with pain in the back and symmetrically distributed in the limbs, is another fever in which organisms are deposited in massive amount from the blood in the bone marrow.

In thus boldly dubbing the symmetrically distributed pains of a restricted group of micro-organismal diseases "marrow pains," the author may appear to show a degree of assurance greater than he himself entertains or than the evidence warrants. Headache and backache certainly are associated with disease of structures other than those here indicated, though their conjunction in one and the same disease is not altogether common. The particular phrase used in the title of the paper was chosen rather with a view to invite inquiry by clinicians (short of that it may serve, until controverted, as a convenient mnemonic), for in dealing with the difficult question of malaise and pain in fevers any rationally constructed hypothesis seems worthy of systematic critical study. It is not beyond possibility that the pains in question are indeed marrow pains, in which eventuality their further investigation may prove to have a helpful bearing on early diagnosis.

While the organisms of many diseases, when liberated into the blood, find a lodgment in the particular organs above specified, it should not be assumed that any and every variety of organism must under similar circumstances suffer an identical fate. To be caught in liver, spleen and bone marrow, the organism must possess a surface similar, in respect of its (molecular) adhesive relationships, to Indian ink particles—see a paper by the author on this subject (2). The problem of grouping micro-organisms according as they are or are not liable to be ingested by liver, spleen and bone marrow, when they are artificially introduced into the blood, is one that has yet to be worked out by pathologists and bacteriologists, and, it may be added, one that would seem to deserve systematic investigation.

Apart from the special question of bone marrow involvement, one additional point of clinical and pathological interest in connection with the above mentioned Indian ink experiments is the astonishing speed and efficiency with which foreign particles mingled with the rapidly coursing blood are sifted out and held captive in fixed localities. Within the space of a single hour millions and millions of particles may be removed from suspension in the circulating plasma. This striking experimental result helps to throw light on the difficulty so frequently experienced in isolating from the blood organisms which are known to be transported in enormous numbers by it (consider e.g. so-called "septicaemia" or typhoid fever). Malarial organisms can be found with the microscope in films of blood because inside red blood corpuscles they are temporarily protected against phagocytic capture.

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A RATIONAL TREATMENT OF SURGICAL SHOCK BASED ON PROVEN PHYSIOLOGICAL DATA*

A. R. MUNROE, M.D.

Surgeon-in-Chief Strathcona Hospital Edmonton; Instructor in Surgery, University of Alberta

THE condition met with clinically known as surgical shock is the end result of several contributing causes. That there are many such seems clear and up to the present no single etiological factor has been accepted as the invariable cause. Clinical observations and physiological studies all tend to show that shock is essentially a partial suspension of circulation. This state of altered circulation will account for practically all the phenomena commonly seen in shock such as pallor, thirst, rapid pulse, low blood pressure and capillary stasis. Most of these symptoms are similar to those seen after haemorrhage but in shock the blood picture does not indicate the degree of anaemia one would expect to find associated with the other severe symptoms.

The changes which take place in the altered state of circulation may be considered under the following headings:

1.—Change in Blood Volume.
2.—Change in Distribution of Red Blood Cells.
3.—Change in Haemoglobin.
4.—Change in Blood Pressure.
5.—Change in the Chemistry of the Blood.

Keith (1) in his studies of shock found that the total volume of blood and plasma was consistently reduced in all cases of shock and the diminished blood volume was in direct ratio to the severity of the symptoms present in any given case of shock. Mann (2) in his experiments on animals found the amount of blood stagnant in the tissues in shock to be as high as 50% above the normal. Ray and Brown (3) noted that in chloroform anaesthesia the capillaries were double their normal diameter thus quadrupling their capacity. These facts show that a considerable volume of blood is lost to the circulation.

Cannon, Fraser and Hooper (4) in their study of shock made valuable observations on the changes which take place in the distribution of the red blood corpuscles and concluded

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1.—That the red cell count of blood taken from various capillaries is higher than that taken from veins.

2.—The discrepancy is greater the more profound the shock, and not infrequently is as great as 2,000,000 per cubic millimeter.

3.—Since the blood in the veins is normal the difference is due to stagnation of the corpuscles in the capillaries.

Bazett (5) found that in shock, due to any cause, the percentage of haemoglobin was reduced. He believes that the estimation of the degree of haemoglobinaemia to be as important as the estimation of the blood pressure.

That there was a lowering of the blood pressure in all cases of shock has long been recognised. Cowell (6) in the late war made extensive studies of soldiers suffering from wound shock. His observations embraced all varieties of battle injuries and show that wound shock is always accompanied by a fall of blood pressure. In certain types of cases the systolic blood pressure may be as low as 30 mm. of mercury. Shock may come on at once after injury and is termed primary shock; or it may come on later as a result of exposure to cold, pain, anxiety, thrist, or toxemia and is termed secondary shock. Any patient with a systolic blood pressure below 90 should be regarded as in a critical state.

Undoubtedly changes take place in the chemistry of the blood also which are not yet understood. We know normal blood is alkaline and in shock there is an acute acidosis. Henderson (7) has shown that there is a deficiency of carbon dioxide in the blood and believes it to be a consequence of acidosis.

Crile (8) in his recent monograph brings forth the theory that shock is a form of exhaustion of brain cells due to excessive stimulation through afferent nerves. This state of exhaustion he thinks may be brought on in a variety of ways, as by fear, anxiety, exposure, trauma, infection, haemorrhage, or excessive stimulation. All these factors can cause exhaustion but the histological changes observed by Crile in the brain cells may be the result rather than the cause of shock.

It may be concluded, as having been demonstrated, that in the patient suffering from shock there is less than the normal amount of blood in circulation; there is a stagnation of blood in the capillaries and this stagnant blood is abnormally high in red blood corpuscles; there is a loss of haemoglobin; a diminution of the normal percentage of carbon dioxide in the blood and this lowering of the percentage of carbon dioxide means lowering of the percentage of carbon dioxide means a relative uncrease in the H-ion content or in other words acidosis.

TREATMENT OF SURGICAL SHOCK

From a practical point of view the treatment of surgical shock may be divided into prophylactic and active.

Under the heading of prophylaxis comes the eliminating of factors conducive to shock such as fatigue, worry, fear of operation, excessive or deep anaesthesia, prolonged anaesthesia and draining the tissues of fluids by purging before operation. The anaesthetised patient should be handled as gently as possible and due regard paid to warmth and stimulation. Thirst should be treated at once by rectal drip of glucose—soda solution.

The active treatment I would like to subdivide into the treatment of cases with shock following operation and the treatment of cases with shock requiring operation. If we pay proper attention to prophylaxis we should have few cases of shock following operation. Where shock does occur the following points are worthy of note. Keep patient warm. Elevate foot of bed. Relieve pain by morphine if there is no cyanosis. If there is cyanosis do not give morphine. Crile recommends the administering of nitrous oxide and oxygen for the relief of pain in cyanotic patients. Transfuse if systolic blood pressure remains below 90 for more than half an hour. Blood transfusion is to be preferred if a suitable donor can be obtained at once but where this is not practicable give 500 c.c. of gum-saline solution intravenously. A second transfusion may be necessary. Large quantities of fluids should be given by mouth or rectal drip for the succeeding 24 hours. Do not rely on drugs, their action is so uncertain that they cannot be relied upon.

In the management of cases of shock which require a serious operation we have a much more difficult task before us. Performing a major operation on a patient in a severe state of shock means certain death. The shock of the operation added to that already present lowers the point of exhaustion to a level from which there is no return. Certain types of injuries are prone to be accompanied by shock e.g., fractured femurs, all compound fractures, head injuries, ruptured viscus. In all such cases the so-called emergency operation performed without allowing the primary shock to pass off may mean death. The use of the sphygmo-manometer and the haemoglobinometer are of the utmost value in estimating the degree of shock and indicating when operation may be safely undertaken.

Bazett (9) considers a haemoglobinaemia of 35-40% the critical point, where the haemoglobin reading is as low as this it is a contra indication to immediate operation. Where the systolic blood pressure is below 90 it is also a contra indication to immediate operation. We have here two clinical tests at the disposal of everyone which can be put to use in a few minutes and should govern the subsequent treatment of the shocked patient so as to bring him safely to and safely through an operation. Primary or secondary shock may pass off with the employment of such simple remedies as securing of rest bya dministration of enough morphine to keep patient comfortable, application of heat, arrest of haemorrhage, allaying of thirst. Where systolic blood pressure remains below 90 for one half an hour transfuse with 500 c.c. of citrated blood, or gum-saline solution. Delay operation until the blood pressure is stabilised. It is preferable to delay operation till blood pressure reaches 100 as the operation will likely cause a second drop in blood pressure. This is particularly so if the operation is likely to necessitate much bleeding. A second drop in the blood pressure is a more serious symptom than the first and makes blood transfusion imperative. The choice of an anaesthetic is also important. Marshall (10) clearly shows the advantage of nitrous oxide and oxygen in these cases and Crile (11) gives a preference for nitrous oxide and oxygen in all cases. He believes that ether and chloroform allow afferent impulses to reach the brain and these stimulating impulses cause an exhaustion of brain cells. We all know ether or chloroform anaesthesia to be a much greater tax on the average patient than nitrous oxide and oxygen and the patient in shock is a poor operative risk.

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ANTERIOR POLIOMYELITIS*

A. A. MURRAY, M.D.

Orthopaedic Surgeon, Children's Hospital, Winnipeg

THE following notes regarding recent cases of anterior poliomyelitis are based chiefly on the Children's Hospital records from October 1, 1920, until the end of October 1921; a period of 13 months. Included in the review are some cases which one had the opportunity of seeing in one's own practice and through the kindness of other doctors. The number of cases is too small to draw therefrom any far reaching conclusions.

A short study of these cases will, however, convey to us some idea of local conditions in regard to poliomyelitis. In October 1920 we noticed that the cases of recent anterior poliomyelitis were more frequent than usual in the out-patient department and in the wards. Before the end of November twenty-five cases, all of which had developed within the past two months, were examined. Seventeen additional cases have been seen since then; making in all forty-two cases which will be reviewed.

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In 1920 fifty-four cases were reported to the Provincial Health Department. During the same period, forty-seven cases were reported to the City Health Department of Winnipeg. Of the fifty-four cases reported to the Provincial Health Department in 1920, forty-five were from Winnipeg, and nine from the country. In 1919, two cases were reported, one from the city and one from the country. In 1918, sixty-two cases; two from the city and sixty from the country. So far this year nineteen cases have been reported.

Examination of those reported to the City Health Department in 1920, shows that 25% of the cases died. Under one year there were three cases with no deaths. Between two and six years, thirty-two cases, with ten deaths. That is 83% of the deaths were between two and six years of age. This is the largest number of cases ever reported from the city in one year. It is likely that a larger percentage of the cases occurring are reported each succeeding year. However, as far as I have been able to discover, there have been no more cases during the last thirteen months than in any corresponding period in the history of the city.

Anterior poliomyelitis is an infectious disease. The lesions produced by the virus are most marked in the nervous system but they are present in other viscera as well. The cases analysed below are ones in which paralysis developed. I know nothing of the cases which occurred in which paralysis did not develop. Evidently there are many such. A study of the cases actually examined in the Children's Hospital and in practice is as follows:

Seasonal Influences.—89% of the cases developed during the months of September, October, November, and December. 54% during October and November. Of those reported to the City Hall in 1920, 70% occurred in October.

Sex.—43% of those affected were males, and 57% were females.

Age Incidence.—The youngest child seen was eleven months old, and the eldest twelve years. 47% of the cases were under three years and 76% under six years of age.

Sociological.—Four cases were from the farm. All the other cases were from homes of people in very humble circumstances, some of them very poor. There were no two cases in the same family. There were sometimes two or more cases in the same community.

Distribution of the paralysis.—The muscles of the neck were markedly affected in four cases. One or both of the upper limbs was affected in 25% of the cases, chiefly the deltoid. In no cases were the muscles controlling the elbow affected. Both lower limbs were affected in 28% of the cases. Where one lower limb alone was affected paralysis was 1½ times more common in the left than in the right.

Symptoms.—The most common symptom complained of was headache; the next fever with a temperature of 101°; occasionally, 104° or 105° Gastro-intestinal disturbances were common, vomiting being frequent in the early stage of the disease. Pain in the back and limbs, was in some cases very severe, causing the child to cry out when touched or moved. Pain in one leg may simulate very closely that of scurvy or acute osteomyelitis. Occasionally the illness was ushered in by a convulsion. In one case a partial paralysis of the muscles controlling the right ankle was the first thing noticed. The trunk muscles, particularly the abdominal, were affected in many cases. The muscle most frequently paralysed was the tibialis anterior. In the cases in which the blood was examined (only few in number) there was no leucocytosis. The largest number of white cells found was 9,000. The smallest number 6,600. The average 7,700. The average number of polymorphs was 60% and lymphocytes 35%. There were only a few examinations made of the spinal fluid. The fluid was reported to be under pressure. The pressure, however, was not accurately measured, and the observation is of little or no value. In only one were the cells increased. No electrical tests were made. No case gave a history of retention of urine. In those cases where the abdominal muscles were paralysed, constipation was a troublesome symptom.

Prognosis.—Of the cases reported to the City Hall 25% died. 7% of the cases seen in consultation died. One post mortem examination was made. This case is of some interest. It was severe, the neck and trunk muscles were badly affected, as were the right upper and both lower limbs. The child was making good progress towards recovery when an irregular was called in. He gave her heavy massage of the back seven weeks after the onset of the disease. She developed meningeal symptoms and died. The regular physician would not sign the death certificate; hence the post mortem. As regards permanent paralysis prognosis is difficult. In some cases a year has passed and certain muscles are still paralysed. Jones says that a muscle which is absolutely paralysed after twelve months may be regarded as hopeless.

Treatment.—A few notes about treatment during the acute and early convalescent stages. Cases were isolated for three weeks. Nasal discharges burned. A laxative given. Easily digested food provided. Also plenty of water. The first essential of treatment is absolute rest. The patient should be put to bed, and kept there for a period, ranging from three to eight weeks, according to the severity of the symptoms and the damage done. On this point Sir Robert Jones in an article in the *British Medical Journal,* February 5, 1921, says: "We do not know enough of infantile paralysis in spite of the investigations that have recently been made by Flexner, Clark, Osgood and Lovett, but we have sufficient knowledge to treat it as a dangerously infective disease which should involve placing the family in quarantine and guarding the healthy children as strictly as they would be guarded against any other acute infectious disease. The early treatment of infantile paralysis is in the hands of the family doctor. Treatment should be undertaken at once, and should consist of complete rest of the nerves and muscles. I should make it a rule in every case, whether pain is present or not, to keep the head and spine at rest just as if we were treating an inflamed area. During both the acute and early convalescent stage the treatment should be protective, and this term should include the prevention of postural errors such as tend to give an initial bias towards deformity."

Dr. R. W. Lovett in the *Journal Surgery Gynecology and Obstetrics,* January 1921, says: "I am a firm believer in the need of rest in the early stages and so long as weakened muscles are improving under treatment."

Dr. A. Myers in making personal observations of the early treatment of 1,000 cases of infantile paralysis says: "that the greatest fault is the use of electricity instead of absolute rest in the early stages." Pain must be relieved, if necessary, by morphine. The next thing to which we must give very careful attention is posture. Every case must be studied in detail and dealt with according to its special requirements. The principle which should guide us in this is, that a paralysed muscle should be relaxed and placed in a position of rest. There is a definite relation between the final type of paralysis and the routine daily position. The position most favourable to recovery and the prevention of deformities is best maintained by the use of suitable splints. Sometimes plaster of Paris is necessary. When sponging the patients or changing the bed linen care must be taken not to stretch weak muscles. For example, if the trunk muscles are hit, the patient should not sit up, or if the deltoid is affected the arm should not be allowed down by the side. When splintsa re used, care must be taken that pressure sores do not develop. Where straps or bandages are used to hold a limb in a splint, the muscles themselves should be free of all pressure. Patients should be kept warm. Particularly when having treatment. If proper methods to prevent deformities are adopted during the acute and early convalescent stage of the disease, the period of recovery will be shortened and much operative treatment avoided. The use of the Violet rays, electric vibrator and many other popular methods of treatment are of doubtful value. Moreover, they are generally very costly, and, as most of these cases are in humble circumstances, it is customary to advise them not to waste their money on forms of treatment which are expensive and will do little good. How to handle some of these patients is a very difficult problem. Treatment is prolonged and progress towards recovery slow. Patients are apt to become discouraged, accept the advice of every busybody in the community, and finally give up treatment altogether. Massage and reeducative training should not commence until after pain has entirely disappeared. When such treatment is begun, we must be careful not to overtax weakened muscles. The paralysed limb must be kept warm. A cold muscle will not work well. When the patient gets up the amount of exercise allowed must, at first, be very small, and increased slowly. Never exercise to the point of fatigue. Muscles can be injured by too vigorous and prolonged massage as well as by overwork. Massage and muscle training should be carried out by one specially trained for the work.

In Conclusion.—Let me point out that cases of anterior poliomyelitis should be followed up, and not permitted to drift after the acute stage is past. All of these cases if properly treated can be made self-supporting and an asset instead of a liability to the state.

PANCREATIC EXTRACTS IN THE TREATMENT OF DIABETES MELLITUS

PRELIMINARY REPORT BY F. G. BANTING AND C. H. BEST, *Dept. of Physiology*

J. B. COLLIP, *Dept. of Path. Chemistry*

W. R. CAMPBELL AND A. A. FLETCHER, *Dept. of Medicine, University of Toronto, and Toronto General Hospital*

SINCE the year 1889, when von Mering and Minkowski (1) produced severe and fatal diabetes by total removal of the pancreas in dogs, many investigators have endeavoured to obtain some beneficial effect in diabetes mellitus, either by feeding pancreas, or by administration of pancreatic extracts.

Minkowski, Sandmeyer (2), Pfluger (3) and others found that feeding pancreas was followed by negative or even harmful results. More recently, Murlin (4), Kleiner (5) and Paulesco (6) have tried the effects of aqueous extracts of the pancreas intravenously, on depancreatized animals and have found transitory reduction in the percentage of blood sugar and in the sugar excreted in the urine.

In 1907, Rennie and Fraser (7), recognizing the possibility that pancreatic enzymes might have harmful effects on the internal secretions, secured islet tissue from teleosteal fishes, where it exists separately from the rest of the pancreas, and fed it to human diabetics. Their studies demonstrated no beneficial influence on the condition of the patient. E. L. Scott (8) in 1912 sought to eliminate the influence of proteolytic enzymes by using alcoholic extracts of the pancreas. He did not find, however, that such extracts caused as marked a reduction in the urinary sugar or in the G-N. ratio as when extracts were made with acidulated water. The whole question has been reviewed recently by Allen: (9), by him, and, indeed, by the majority of recent writers, it is usually stated that pancreatic extracts have no clinical value whatsoever. During the past ten months, two of us (F. G. B. and C. H. B.), working in the Department of Physiology of the University of Toronto, have reinvestigated the problem. Certain of the results obtained have already been published, (10) others are now in press. These may be briefly reviewed here.

Believing that extracts of the pancreas, as usually prepared, did not satisfactorily demonstrate the presence of an internal secretion acting on carbohydrate metabolism, because the active principle was destroyed by the digestive enzymes also present in such extracts, attempts were made to eliminate these enzymes. In the first experiments, this was done by taking advantage of the fact that the acinous tissue (from which the digestive enzymes are derived) but not the insular tissue of the pancreas degenerates in seven to ten weeks after ligation of the pancreatic ducts. Extracts were therefore made with ice-cold Ringer's solution, of degenerated pancreatic tissue removed ten weeks after the ligation of the ducts. The extract obtained by this procedure, when injected intravenously or subcutaneously into diabetic dogs, invariably caused a marked reduction in blood sugar and in the amount of sugar excreted in the urine. It also enabled a diabetic dog to retain a much higher percentage of injected sugar than it otherwise would. Extracts of liver or spleen, prepared in the same manner as the extracts of degenerated pancreas, were found to have neither of these effects. The active principle of the extract of degenerated pancreas was destroyed by boiling in neutral or acid solution or by incubating for two hours at body temperature with pancreatic juice.

In later experiments, it was found that the pancreas of foetal calves of under five months development did not contain proteolytic enzymes, thus confirming the observations of Ibrahim (11). By extracting such foetal pancreatic tissue, a highly potent and readily procurable preparation was obtained. Besides affording a much more practicable method for securing larger quantities of extracts, this result demonstrated that the active principle is essentially the same from whatever animal it is prepared. A method was finally evolved by which an active extract, which would retain its potency for at least one month, could be obtained from normal adult ox pancreas. Daily injections of pancreatic extract (foetal calf or adult beef pancreas) prolonged life of a completely diabetic dog to seventy days, at the end of which time the animal was chloroformed. Allen states that in his experience completely diabetic dogs do not live more than fourteen days. The first results of a study of the respiratory exchange in completely diabetic dogs, before and after administration of extract, showed that the extract confers on the diabetic animal the power to burn carbohydrates. Thus, in a diabetic dog, on starvation or lean meat diet, the respiratory quotient was found to be in the neighborhood of 0.7. The ingestion of carbohydrate caused no rise in the $\frac{CO_2}{O_2}$ ratio, but when preceded by an injection of extract gave a value which approached I.O., indicating that carbohydrate was being burned. Besides the above, it should be recorded that the administration of extract very quickly caused striking improvement in the various symptoms known to be characteristic of complete pancreatectomy.

As the results obtained by Banting and Best led us to expect that potent extracts, suitable for administration to the human diabetic subject, could be prepared, one of us (J. B. C.) took up the problem of the isolation of the active principle of the gland. As a result of this latter investigation, an extract has been prepared from the whole gland, which is sterile and highly potent, and which can be administered subcutaneously to the human subject. The preparation of such an extract made possible at once the study of its effects upon the human diabetic, the preliminary results of which study are herein reported. The extract containing the active principle is being further purified and concentrated. A detailed report of the method of extraction, purification and concentration will be published at an early date.

For the investigation of the clinical application of these extracts in the treatment of human diabetes, Professor Graham has placed at the disposal of two of us (W. R. C. and A. A. F.) the cases of diabetes mellitus in the wards of the Medical Service of the Toronto General Hospital.

Patients were placed on a constant diet, varying with the severity of each individual case, and their reaction to such treatment studied for a period of a week, after which various samples of extract were administered and the effects observed. The ordinary routine clinical examinations were carried through. Blood sugar was estimated at intervals by the revised Folin-Wu method, urinary sugar by Benedict's methods, the acetone bodies by Van Slyke's methods, and the respiratory quotient by the Tissot-Haldane and Douglas-Haldane methods.

Up to the present time, February 22nd, 1922, the effects of these preparations have been observed in seven cases of diabetes mellitus and it is now evident that certain definite results can be obtained by their administration. The effects observed in depancreatized animals have been paralleled in man. The fall in blood sugar occurs and in two cases, repeatedly examined, a rise in the respiratory quotient, indicating carbohydrate utilization, occurs more or less coincidently with the attainment of a normal blood sugar level. Patients report a complete relief from the subjective symptoms of the disease. The sugar excretion shows marked decrease or, if dosage be adequate, disappears. Ketonuria is abolished, thus confirming a similar observation by Collip in diabetic animals, (results as yet unpublished). These results taken together have been such as to leave no doubt that in these extracts we have a therapeutic measure of unquestionable value in the treatment of certain phases of the disease in man. In agreement with observations of other investigators on laboratory animals, it has been found that without careful control severe toxic reactions may be encountered and this will undoubtedly be a factor in the evaluation of the ultimate therapeutic utility of the method.

The following case report illustrates these observations:

Name.—L. T. (Boy), *Aged*-14

Admitted to the Medical Wards, Toronto General Hospital, December 2nd, 1921.

Present Illness.—About December 1919, he was taken to his family physician because he had been wetting the bed at nights, and also because his ankles became swollen occasionally. One month later, sugar wats found in the urine. He states that at this time he was in good health, his appetite was somewhat excessive, but no increased thirst was complained of. Careful dietetic regulation was prescribed and he states that he adhered to this diet fairly well. This his family physician will not confirm. Fasting was also tried apparently without success. The glycosuria persisted, he began to lose weight, fre-

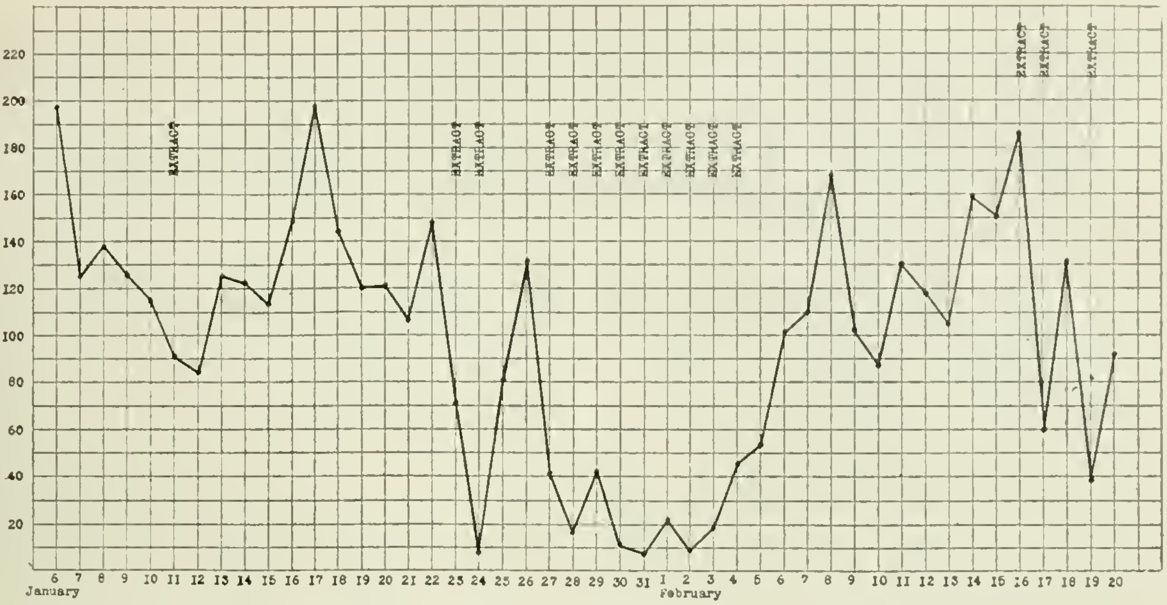

CHART I.—*Effect of extract on glycosuria*

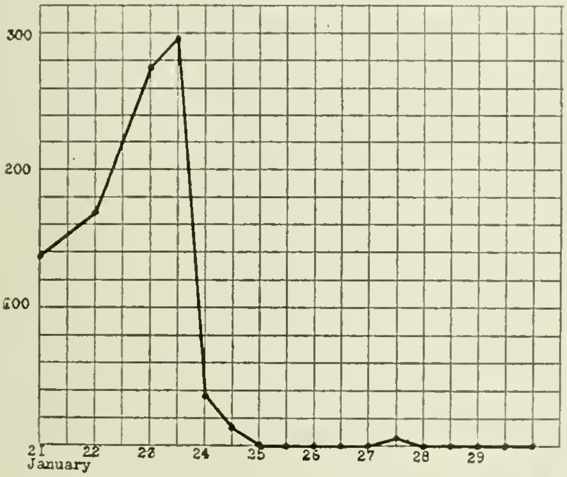

CHART II.—*Showing the cessation of ketonuria following administration of extract*

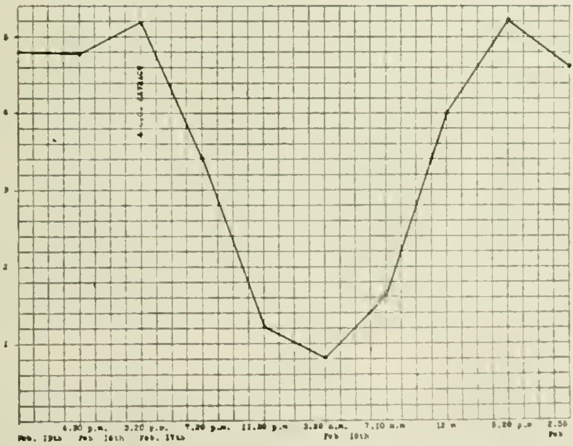

CHART III.—*Effect of one injection of extroct on Blood Sugar (mgs. per c.c.c=tenth per cent)*

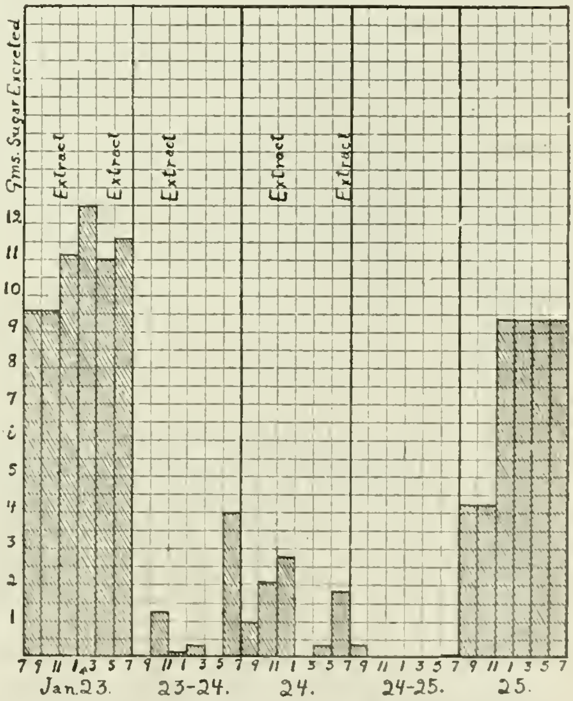

CHART IV.—*Curve of glucose excretion during extract administration. Large dots indicate blood sugar* quency of micturition, both day and night, increased up to the time when his physician recommended admission to hospital.

Past Illness.—Always healthy up until two and one half years ago, with the exception of an attack of chicken-pox at the age of ten and, of discharging ear for two years as a baby.

Personal History.—Born in Canada, went regularly to school, able to work well up to time of onset of present illness. Has always been fond of sweet food and previous to the onset of this condition ate freely of candy.

Family History.—Mother and father, one brother and two sisters, all in good health. No diabetes or other familial diseases known.

Examination.—On admission he was poorly nourished, pale, weight 65 pounds, hair falling out, odour of acetone on the breath, tonsils and teeth in good condition, abdomen large and tympanitic. Blood pressure 100-70. He appeared dull, talked rather slowly, quite willing to lie about all day. Hands show marked xanthochromia. No findings of note in examination of cardio-vascular, respiratory, abdominal systems or of the blood. The urine at the time of admission was strongly acid, specific gravity 10.30 to 10.40. The test for sugar strongly positive. Rothera and ferric chloride tests for ketones strongly positive. 24 hours amount of urine, 3-5 litres. Blood sugar 5.8 mg. per c.c.

Treatment.—He was put to bed and was quite content to remain there most of the time. However, when he wished to do so, he was allowed to get up and wander about the ward, which he did very little during the first month. His diet was as follows:—

Dec. 2nd.—5, 10 and 15% vegetables as much as desired.

Dec. 11th.—60 grams lean meat daily added to diet.

Dec. 15th.—4 bran cakes daily added to diet.

Jan. 4th.—Daily ration to consist of 50 grams lean meat, 5 and 10% vegetables, and fruits and bran cakes to make up exactly 100 grams of carbohydrates per day. Clear broth, cocoa, tea and coffee in moderation. Total intake about 450 calories.

No further change in diet was made.

This case was one of severe juvenile diabetes with ketosis. Previous to admission, he had been starved without evident benefit. During the first month of his stay in hospital, careful dietetic regulation failed to influence the course of the disease and by January 11th his clinical condition made it evident that he was becoming definitely worse.

The extracts given on January 11th were not as concentrated as those used at a later date, and, other than a slightly lowered sugar excretion and a 25% fall in the blood sugar level, no clinical benefit was evidenced.

Daily injections of the extract were made from January 23rd to February 4th (excepting January 25th and 26th). This resulted in immediate improvement. The excretion of sugar as shown in Chart I became much less. On days of treatment, this varied from 7.5 gms. to 45.1 gms. compared with a previous amount well over 100 gms. daily. The acetone bodies disappeared from the urine. The boy became brighter, more active, looked better and said he felt stronger. No extract was given from February 5th to February 15th. During this time sugar again appeared in the urine in large amounts along with traces of acetone. Administration of extract in smaller doses after February 16th again resulted in lowered sugar excretion and disappearance of acetone from the urine. Chart II shows the fall in the total acetone bodies of the urine during the periods of treatment after January 23rd. Chart III gives a four hour record of the blood sugar following the administration of a single dose of 6 c.c. extract on February 17th. Chart IV shows the influence of extract on the amount of glucose excreted in each two hourly period when extract was being used. Table I records the volume of urine and amount of sugar excreted each day and blood sugar determinations. The qualitative test for the daily excretion of acetone bodies in the urine and the amount of extract given is also tabulated.

Although the other six patients treated by these extracts were all favourably influenced by its administration, particular reference might be made to one—a severe case who had been excreting 20 gms. of glucose on a diet containing 10 gms. carbohydrate and 24 hundred calories per day. Following injection of the extract his urine became sugar free, and he obtained complete relief from severe depression and extreme lassitude. Repiratory quotients in this same case showed a definite rise after injection of the extract, confirming the increased utilization of carbohydrate.

All patients were improved clinically. It is difficult to put in words what is meant by clinical improvement. Those who have been treating diabetes will have recognized as early signs of improvement a certain change in the skin, the appearance of the eyes, the behaviour of the patient, his mental and psychic activity, and the physical evidences, as well as his testimony, of increased vigor and desire to use his muscles. Under present day treatment, such improvement occurs in diabetics free from acetone but is undoubtedly more striking in patients recovering from a ketosis. This is the nature of the improvement seen clinically as a result of the administration of these extracts, and, while it is of a temporary nature, we believe that it justifies the hope of more permanent results following more adequate and carefully regulated dosage.

TABLE I.

Date	24 hr. amount of urine in c.c.	24 hr. excretion of glucose in gms.	Blood Sugar in mg. per c.c.	Rothera Test	Total acetone bodies in mgs. per litre	Subcutaneous injection of pancreatic *extract in c.c.* A.M.	P.M.
Dec. 12th	....	....	5.8	plus plus	....	....	
20th	....	....	4.5	plus plus	....	....	
29th	....	....	5.2	plus plus	....	....	
Jan. 3rd	....	....	5 2	plus plus	....	....	
6th	4500	187.8	....	plus plus	....	....	
7th	4020	126.2	....	plus plus	....	....	
8th	3650	137.2	....	plus plus	72	....	
9th	3690	126.7	6.2	plus	540	....	
10th	6870	114.0	....	plus plus	....	....	
11th	3625	91.5	3.2–4.4	plus plus	188		15 c.c.
12th	4060	84	4.9	plus plus	69	....	
13th	3950	125.5	....	plus	....	....	
14th	3780	123.5	....	plus plus	....	....	
15th	3900	114.7	....	plus plus	....	....	
16th	3910	148.0	....	plus plus	....	....	
17th	3960	197.3	6.7	plus plus	....	....	
18th	4300	144.6	....	plus plus	....	....	
19th	3770	120.6	....	plus plus	....	....	
20th	3840	121.9	....	plus plus	....	....	
21st	4580	107.3	....	plus plus	137	....	
22nd	4540	148.5	....	plus plus	167	....	
23rd	4210	71.1	5.2	plus plus	282	5 c.c.	20 c.c.
24th	4120	8.7	1.2–3.0	plus	30	10 c.c.	10 c.c.
25th	3880	80.5	....	0	0	....	
26th	5070	130.3	....	0	0	....	
27th	3040	42.2	....	plus	4	4 c.c.	4 c.c.
28th	5125	16.7	....	trace	0	2 c.c.	4 c.c.
29th	3275	42 5	....	0	0	4 c.c.	
30th	2715	11.5	....	trace	0	4 c.c.	4 c.c.
31st	4415	7.5	....	0	0	4 c.c.	4 c.c.
Feb. 1st	3145	21.8	....	0	0	4½ c.c.	4 c.c.
2nd	2700	9.1	....	0	0	5 c.c.	4 c.c.
3rd	4150	18.2	....	0	0	5 c.c.	4 c.c.
4th	3740	45.1	....	0	0	5 c.c.	4 c.c.
5th	3475	53.3	....	0	0	....	
6th	3900	101.5	....	0	0	....	
7th	3700	110 1	....	0	0	....	
8th	4910	167.1	....	trace	0	....	
9th	4940	101.7	....	0	0	....	
10th	4710	86.9	....	trace	0	....	
11th	4510	129.9	....	trace	0	....	
12th	3170	117.7	4.87	trace	0	....	
13th	2595	106.7	4.9	trace	0	....	
14th	4670	158.5	....	trace	0	....	
15th	3275	151 4	....	trace	0	....	
16th	4611	185.0	4.73	neg.	0		5 c.c.
17th	3930	60.4	0.85–5.2	neg.	0		6 c.c.
18th	4790	132.3	2.0–4.5	neg.	0	....	
19th	3105	39.6	....	neg.	0		4 c.c.
20th	3985	92 0	....	neg.	0	....	

SUMMARY

Following the production of what appears to be a concentrated internal secretion of the pancreas and the demonstration of its physiological activity in animals, and, under careful control, its relatively low toxicity, we are presenting a preliminary report on the pharmacological activity of this extract in human diabetes mellitus. Clinical observations at this juncture would appear to justify the following conclusions:—

(1) Blood sugar can be markedly reduced even to the normal values.

(2) Glycosuria can be abolished.

(3) The acetone bodies can be made to disappear from the urine.

(4) The respiratory quotient shows evidence of increased utilization of carbohydrates.

(5) A definite improvement is observed in the general condition of these patients and in addition the patients themselves report a subjective sense of well being and increased vigor for a period following the administration of these preparations.

For their hearty co-operation and kindly assistance and advice, we have great pleasure in presenting our best thanks to Professor J. J. R. MacLeod of the Department of Physiology, to Professor V. E. Henderson of the Department of Pharmacology, to Professor J. G. Fitzgerald of the Department of Hygiene, and to Professor Duncan Graham of the Department of Medicine of the University of Toronto.

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New Opium Laws in Great Britain.—In compliance with the agreement at the Hague International Opium Convention in 1912, Great Britain in 1920 adopted a law for the regulation of traffic in narcotic drugs. This bill would doubtless have been adopted long before, had it not been for the war. The regulations under the act went into effect September 1. "As originally drafted by the Home Office," says the *British Medical Journal* editorially, "they were open to much legitimate criticism; but after emendations by a departmental committee, in accordance with the recommendations of the British Medical Association, these are now in a form better calculated to achieve the end desired without impeding the legitimate use of the drugs in question." In addition to the international agreement under the Hague Convention, the Versailles treaty creating a league of nations, contained a paragraph pledging all of the powers that were signatories to the treaty to enact effective laws for the regulation of dangerous drugs within twelve months from the time that these treaties went into effect. The advisory committee appointed by the Council of the League of Nations will present a report at the assembly of the league in Geneva this month, summarizing the action taken by the various nations. The advisory committee, on the initiative of Dr. Wellington Koo, Chinese minister to Great Britain, proposes to undertake investigations to ascertain approximately what amount of opium, morphin and cocain is required for legitimate medical purposes, with a view to inaugurating international methods for restricting the manufacture of these drugs to the amount necessary for medical and scientific requirements. It has been generally recognized by those interested in the regulation of narcotic drugs that this problem could never be satisfactorily solved except through general international agreement and co-operation. Restriction of the growth and manufacture of these drugs to the amount necessary for legitimate needs, and international co-operation for the prevention of smuggling across boundary lines, are the most essential features in any plan for the control of this traffic The problem is world-wide, and the co-operation of all civilized nations is essential for its solution.—*Jour. A. M. A.*, Sept. 24, 1921.

WE understand that a bust of Dr. W. T. G. Morton, the discoverer of anæsthesia, will be placed in the Hall of Fame. At the annual dinner of the American Anæsthetists Dr. S. A. Knopf proposed that the price should be contributed in great part by the anæsthetists of America, and urges those who are interested to make a contribution.

THE BLOOD CHOLESTEROL, ITS IMPORTANCE, AND THE VALUE OF ITS DETERMINATION IN CANCER RESEARCH*

Georgine Luden, M.D., Ph.D.

First Assistant in Cancer Research, Mayo Foundation, Rochester, Minnesota.

THE cancer problem is undoubtedly one of the greatest problems of civilisation and its solution of the utmost importance because of the innumerable victims of malignant growth. The value of studying the functional efficiency of the body structures, rather than their morphologic appearance, has been recognized in many fields of modern medicine. It is no longer a matter of debate that, in diabetes, for instance, histologic examination gave but little information, even when the pancreas itself was studied, whereas the chemical analysis of the blood and the urine not only revealed the nature of the disease, but insured a far more successful treatment.

The life of every cell in the body depends upon its blood supply; this is universally conceded. The blood is practically the only food supply to which the cells have access. It contains numerous chemical constituents: proteins and their derivatives, glucose, inorganic salts, and lipoids, such as lecithin and cholesterol. It is obvious that the relative proportions in which these chemical constituents are present in the blood will play an important part, not only with regard to the general welfare of the body as a whole, but also of the individual cell units.

The blood cholesterol, one of the chief blood lipoids, deserves special consideration because it is intimately associated with the problems of growth and cell proliferation and of resistance to bacterial invasion.

Cholesterol appears to be a substance which the body cannot afford to be deprived of, for Dezani's experiments showed that mice fed on an entirely cholesterol-free diet succumbed after apparently synthesizing cholesterol for a short time; cholesterol was found in the feces during the cholesterol-free diet, the mice increased in size and weight, and their total cholesterol content augmented by one-third, but they all died at the end of seventeen days. Since all animal cells contain some cholesterol, and practically all the staple foods as well, though in varying amounts, a total cholesterol deficit is not likely to occur in the human body. Reserve deposits of cholesterol occur moreover in the body fat, the brain, the suprarenal cortex, and the liver, so that the synthesis of cholesterol must be looked upon as an emergency measure, under strictly experimental conditions, which it would be difficult to duplicate in every-day life.

Cholesterol and cell proliferation. It has been shown by the work of Dorée, Ellis, Gardner, Fraser and Lander, of Browder, and of Robertson and Burnett, that cholesterol takes an active part in cell proliferation. Whether it acts as a catalyzer, as Robertson and Burnett have suggested, or whether it is merely used up as building material in the formation of cells is not known definitely. The experiments of Ellis and Gardner, who incubated hen's eggs for different periods and showed by determinations that the cholesterol content of the egg yolk diminished parallel with the increase of the volume of the chick embryo, make it seem probable that cholesterol is used directly for the manufacture of cells. Robertson and Burnett in experimenting with tumour-grafted rats, showed that intravenous injections of cholesterol in sodium oleate cause the tumours in the injected animals to grow twice as fast as in the controls, all the rats having been grafted at the same time and with the same tumour.

Investigations of the writer.—The fact that in Robertson and Burnett's experiments on rats the injected cholesterol was manifestly carried to the tumour cells by the blood, because the injections were made intravenously on the side of the animals as far removed from the graft as possible, led me to investigate the cholesterol content of the blood in malignant conditions, and to study the factors which might influence the blood cholesterol. The problems involved proved far more numerous and more complex than I had anticipated. Between 1915 and 1921 more than 3,000 samples were analyzed for cholesterol. The samples comprised the blood of human beings in health and in disease and under experimental conditions; the blood of goats, gophers, dogs and rabbits; blood taken at necropsy, several hours after death, and pus, bile and foodstuffs. Since two determinations at least were made on every sample the series represents between 6,000 and 7,000 determinations.

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*Presented before the Victoria Medical Association, Victoria, June 23, 1921 and before the Vancouver Medical Association, Vancouver, June 27, 1921. This article appears in full in the collected papers of the Mayo Clinic, 1921.

Cholesterol and bacterial infection.—If the cholesterol content of the blood promotes the multiplication of cells by some as yet unexplained mechanism, it may be said to have the opposite effect on the growth of pathogenic bacteria. Manfredi showed that the addition of cholesterol to the culture medium (agar-agar) completely inhibited the growth of many pathogenic bacteria if a concentration exceeding 50:10,000 was used. Concentrations of 20:10,000 had an inhibitory effect in the majority of cases, although *Bacillus prodigiosus*, *Bacillus typhosus*, and *Staphylococcus aureus* managed to thrive even in these concentrations. Concentrations exceeding 10:10,000 greatly reduced the growth of many types of bacilli and streptococci (*Bacillus puerperalis*, *Bacillus diphtheriae*, *Streptococcus erysipelatis*) and of the cholera spirillum. Manfredi's observations have recently been corroborated by the clinical investigations of Sisto, who found a constant cholesteremia in typhoid fever, which only receded during convalescence, a marked increase of the blood cholesterol in pneumonia at the onset of the disease, but inconstant findings in pulmonary tuberculosis, exacerbations being accompanied by a rise in the blood cholesterol values. I was able to observe an increase of the blood cholesterol at the onset of symptoms in several patients during the epidemics of influenza in Rochester in 1918, 1919 and 1920. Low blood cholesterol values prevail, on the contrary, in chronic bacterial infections such as tuberculosis, when there is no temporary exacerbation, and in syphilis. It is interesting in this connection that erysipelas has been known to exert a curative influence in malignant conditions, and that Coley's treatment, by which a cure has been wrought in 10 per cent of the cases treated, consists of injections of *Bacillus prodigiosus* and *Bacillus erysipelatis*.

The value of blood cholesterol determinations.—The test for cholesterol in the blood is not a diagnostic test. This must be borne in mind. It is comparable in this respect with many valuable clinical tests, for example, the Wassermann test, and the test for albumin in the urine. Thus, in blood cholesterol determinations, the detection of high cholesterol values accompanied by "gallstone symptoms" does not give conclusive evidence concerning the presence or the absence of stones. although gallstones contain from 80 to 95 per cent cholesterol and are crystalization products of the cholesterol in the bile. Since the liver carries about one third of the total blood volume and the bile is furnished by the liver, the cholesterol content of the blood must influence the cholesterol content of the bile. But, as Rothschild and Rosenthal have pointed out, in cases of cholelithiasis three possibilities should be taken into account in the interpretation of the blood cholesterol values: (1) high blood cholesterol values, no stones being found at operation because the gallstones have not had time to form; (2) low blood cholesterol values accompanied by the finding of stones at operation, which indicates that the cholesterol content of the blood has been reduced because the cholesterol was used for the formation of stones; and (3) high blood cholesterol values and stones in the gallbladder, showing that an opportunity exists for the formation of more stones, especially if the high cholesterol values remain constant even after cholecystectomy. It is in the latter instance that determinations of the blood cholesterol are of special importance, because the persistence of high values shows that the patient is suffering from a more or less permanent impairment of cholesterol metabolism and because the cholesterol content of the blood can be reduced by dietary measures, as Rothschild and Rosenthal have shown, and as I was able to corroborate by a series of dietary experiments on myself. (Fig. 1.) It is not surprising that eggs should further cholesteremia: the cholesterol concentration of the egg yolk is roughly ten times that of normal human blood, 900 mg. per 100 c.c. It is not easy to understand, however, why meat should increase the blood cholesterol to a marked extent, as the cholesterol content of meat is very much lower than that of eggs, and the cholesteremia produced by a diet consisting of Scotch oatmeal exclusively would be wholly inexplicable but for the work of Howard Mueller, because oatmeal contains no cholesterol whatever. Mueller showed that both in vivo and in vitro the chemical character of cholesterol is changed by the influence of the bile and of the pancreatic juice. Bile transforms about one-third of a given amount of cholesterol into cholesterol esters; pancreatic juice converts two-thirds of the cholesterol into esters, but the combination of bile and pancreatic juice causes the esterification of the total amount of cholesterol. It seems possible that an excess of carbohydrates, by overworking the pancreas, may prevent the proper esterification of the blood cholesterol and its subsequent elimination, with a resulting increase of the cholesterol concentration in the blood such as I observed during my oatmeal diet. All the problems involved in the relation between the diet and the blood cholesterol cannot be discussed here; these problems are numerous and intimately connected with the relative efficiency of the pancreas, the liver, the adrenals, and other glands which are concerned in cholesterol metabolism. From a practical point of view it would seem a safe proceeding, however, to advise patients suffering from hypercholesteremia to reduce the intake of eggs, meat, oatmeal, and of cholesterol-rich fish, black bass and salmon, and to use, temporarily, at least, a diet composed chiefly of fruit, vegetables, and milk, blood tests being made to check the effect of the diet.

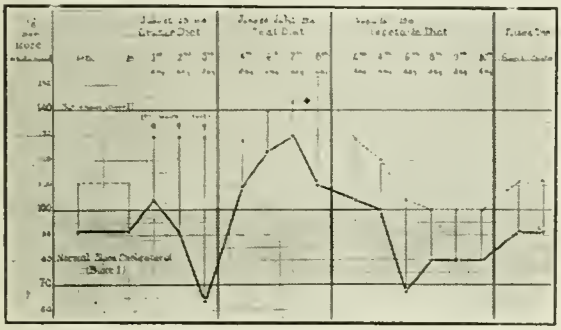

FIG. 1.—Cholesterol determinations on the writer P.S. Personal cholesterol standard from January to June, 1916. The tests were made at irregular intervals and showed practically no variations B. Test made on the day preceding the experimental diets.

Gruner's diet.— Milk and water, bread, lettuce. The Bloor II values (?) could not be determined, the colour reaction being brownish-green because of the great amount of "changed" cholesterol. The Bloor I values dropped rapidly. The Bloor I values are indicated by the solid line, the Bloor II values by the dotted line.

Meat diet.—Meat was used exclusively for every meal; only a very small piece of bread had to be taken "to help the meat down" towards the end of the experiment when meat became very repugnant. Attacks of diarrhea, lowering Bloor I but increasing Bloor II cholesterol values.

Vegetable diet.—Vegetables and fruit exclusively. Observe the drop of the Bloor I values and satisfactory amount of "changed" cholesterol (vertical line). No diarrhea intervened during the vegetable diet, but the blood cholesterol settled down to a lower level.

Mixed diet.—Meat twice a day, vegetables and fruit: usual type of mixed diet. The blood cholesterol returned to its former level. During all the dietary experiments coffee and tea were taken in the usual amounts. but as usual no alcohol.

Experiments on animals showing stimulation of tumour growth by cholesterol.—The dietary experiments of Corson-White on a large series of rats, all grafted with the same strain of a Flexner-Jobling adenocarcinoma, furnish conclusive evidence of the stimulation of tumour growth by cholesterol. Corson-White found that "diets which stimulate most markedly the growth of large tumours (after transplantation) give normal growth curves in normal rats, show a diminution of the number of lymphocytes in the circulating blood and a cholesterol content equal to or higher than normal," and that "those diets on which rats produced the most metastasis gave the highest (blood) cholesterol values." The experiments of Corson-White comprised two types of diets; a normal, adequate diet giving normal growth curves in the controls, and the inadequate diet (Mendel-Osborne) on which the animals remained in good condition but did not grow. Addition of cod liver oil, olive oil, and cholesterol to the normal, adequate diet produced a higher percentage of "takes" and more extensive metastasis (91 per cent) than the normal diet alone (87 per cent); but the addition of the cholesterol furnished the highest percentage of metastasis (94 per cent) in conjunction with the normal diet, and even produced metastasis (0.4 per cent) in combination with inadequate diets, which otherwise gave a small number of takes and seemed to inhibit the development of metastasis (Fig. 2).

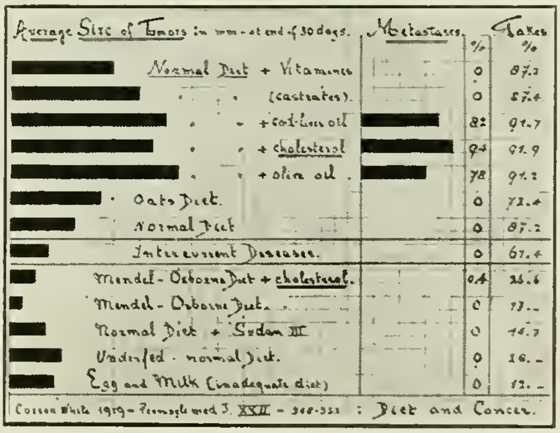

FIG. 2.—Corson-White's dietary experiments on rats grafted with the same strain of a Flexner-Jobling adenocarcinoma. Growth-stimulating diets above the central dividing line; inadequate, growth-retarding diets below the central dividing line. The number of takes and cases of metastasis is markedly increased by addition of cholesterol to the diet, and by the addition of cod liver oil and olive oil. According to Chauffard's observations, fats are transformed into cholesterol.

These findings fully corroborate the observations of Robertson and Burnett, (which formed the basis of Corson-White's work) of Rothschild, and my observations in experimental diets and on the blood of patients suffering from cancer. The stimulation of tumour growth by ingestion of olive oil and cod liver oil is explained by the investigations of Chauffard, Laroche and Grigaut, who found a marked increase of the blood cholesterol after the ingestion of fat, even when the fat contained no cholesterol. This suggests that there is an intra-organic synthesis of cholesterol from fat.

Factors that influence the blood cholesterol.—Cholesterol metabolism is regulated by the activity of several organs, namely, the liver and the pancreas; but the suprarenals, the gonads, and the thyroid may play an even more important part. The suprarenals are probably the chief regulators of cholesterol. The gonads might be termed the principal market for cholesterol, and it is not surprising that disturbances of cholesterol metabolism should be particularly likely to occur when the gonads are either heavily taxed by work, as in pregnancy, or when their activity is declining, as in the menopause. I need but mention the well-known "pregnancy gallstones" and the frequency of malignant growth when reproductive activity ceases. The thyroid has been called the "dynamo" and "the pacemaker" of the body (Crile), because of its influence on the basal metabolic rate. It would almost seem a foregone conclusion that the basal metabolic rate, the rate of burning in the body, should influence cholesterol metabolism, but blood cholesterol determinations were needed to show that this obvious conclusion is really correct (Fig. 3). In myxedema the basal metabolic rate and the blood cholesterol values are inversely proportional; in exophthalmic goitre, when the body engine, so to speak, is going at ninety miles an hour the blood cholesterol values are within the normal and low normal ranges.

Cholesterol determinations should always be made during the postdigestive period, that is, before breakfast, in order to eliminate the temporary increase which is comparable to the digestive leukocytosis. In our determination two tests are made routinely for every blood sample. In the first test (Bloor I method) only the pure or unchanged cholesterol is determined. The second test gives the value of both changed and unchanged cholesterol combined. The difference between the values found in the first test and in the second test (Bloor II method) represents the amount of changed cholesterol or cholesterol split-products, contained in the blood. It has been the use of this two-fold test which revealed anomalies of cholesterol metabolism in malignancy and furnished evidence that the beneficial effect of radium treatment is intimately connected with changes in the chemical composition of the blood (Luden).

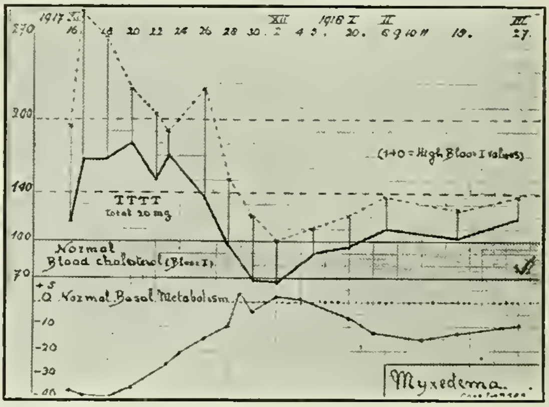

FIG. 3.—The inverse proportion between the basal metabolic rate and the blood cholesterol. The patient, who had a pronounced case of myxedema, became perfectly well after the administration of the thyroid hormone (T), Kendall's thyroxin, 5 mg. at each dose.

The anomalies of the blood cholesterol in cancer: the effect of radium.—A two-fold disturbance of cholesterol metabolism is found in malignant conditions, and especially in carcinoma: namely, a tendency to cholesteremia and a lack of cholesterol split-products in the blood. In other words, the body is not handling or burning its cholesterol as it should. The pure cholesterol may be fitly compared to fuel: unburnt fuel is eminently capable of starting a conflagration. The cholesterol split-products are comparable to consumed fuel, or ashes in a general sense; ashes are not suited to keep a fire burning. A comparative study of the blood cholesterol of seventy patients suffering from diverse types of cancer and of seventy patients suffering from non-malignant conditions showed that high cholesterol values predominate in carcinoma, being accompanied by a lack of cholesterol split-products in the blood, whereas in the non-malignant cases there was no lack of changed cholesterol and the high values were in the minority. After radium treatment the high values changed to medium, or inflammatory values, and the amount of split cholesterol in the blood was markedly increased; the lack of split-products disappeared altogether. The effect of radium on the blood cholesterol was strikingly shown by observations in a case of lupus erythematosus, degenerating into carcinoma. Clinically, the lesions on the patient's nose were typical of lupus erythematosus, but treatment with blue light failed to have the ususal curative effect. The cholesterol tests revealed a total lack of split cholesterol, suggesting the presence of carcinomatous degeneration. Excision of a minute portion of the lesion and microscopic examination of serial sections confirmed this suspicion. Exposure to radium caused the lesions to disappear; cholesterol tests before and after exposure showed that improvement went hand in hand with the activation of cholesterol metabolism (Fig. 4). Two explanations are admissible with regard to the effect of radium on the blood cholesterol. Either the disintegration of the blood cholesterol is caused by the photo-active properties of the radium rays or by the stimulation of the organs that regulate cholesterol metabolism. The experiments of Schulze and Winterstein show that the photographic rays in ordinary daylight produce chemical changes in cholesterol in the test tube; but stimulation of the organs that regulate cholesterol metabolism, resulting in an increased activity of these organs, is strongly suggested by the chemical changes in the composition of the blood, perhaps by the so-called radium sickness, and certainly by the disappearance of metastatic tumours which were not exposed directly to the rays, but located at a considerable distance, the main tumour alone being treated with radium. I have been able to observe repeatedly that patients whose blood cholesterol values did not show changes "in the right direction" did not appear to derive as much benefit from radium treatments as patients in whose blood a marked increase of cholesterol split-products could be demonstrated. This suggests that dietary measures calculated to reduce the work of cholesterol metabolism in conjunction with radium treatment might enhance the effect of the radium treatment itself, the response of the patient being observed by blood cholesterol determinations.

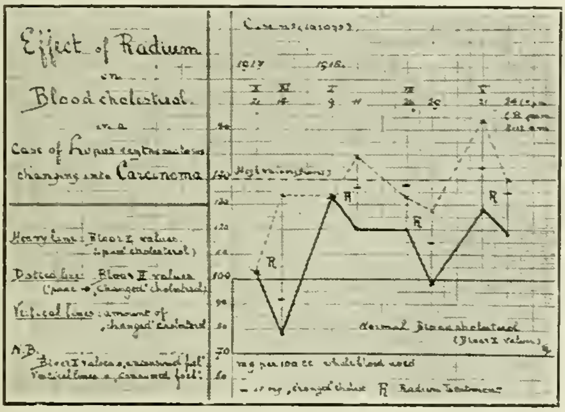

Fig. 4.—The effect of radium treatment on the blood cholesterol in Case 192075. The Bloor I values (heavy line) dropped and the changed cholesterol (vertical line) increased after each radium treatment (R). The small horizontal bar on the vertical denotes the normal minimum of changed cholesterol, 17 mg. per 100 c.c. of whole blood. At the patient's last visit to the Clinic, May 21, the lesion on the nose was barely perceptible, a large amount of changed cholesterol being present in the blood. One more radium treatment was given to complete treatment; the cholesterol determination May 24 was made three hours after exposure to radium.

Before closing I would like to call your attention to an established fact, which I think has received too little consideration, namely the spontaneous regression of malignancy observed in man. Rohdenburg has published a detailed account of 302 cases in which this phenomenon occurred; in roughly one-third of these cases a microscopic diagnosis was made and the subsequent history "carefully controlled." In every instance the condition of the patient had proved to be inoperable, "hopeless." No radium treatment had been given and such operations as had been performed are described as "palliative" or "incomplete." Yet tumours and metastasis disappeared and the patients became "clinically well." The importance of this fact can hardly be overestimated. It is proof positive that the human body can wage a winning fight against malignancy under the most untoward conditions. Changes in the body chemistry, resulting from increased or renewed activity of organs by which the chemical condition in the body are regulated, seems to be the only available explanation since the chemical composition of the blood must influence the body cells. If this be true, the cancer problem must be looked upon as a chemical problem and physiologic chemistry may be expected to furnish its ultimate solution. Much work remains to be done, but cholesterol determinations give some information, at least, concerning the efficiency of cholesterol metabolism in a given case; they help to ascertain the effect of dietary measures and the response of the patient's organism to radium therapy; and they may be expected to reveal the organ initially responsible for the disturbances of cholesterol metabolism which are connected with the lawless proliferation of cells found in malignant disease; hence the value of blood cholesterol determinations and their place in cancer research.

Summary

1.—Cholesterol is an important chemical constituent of the blood.

2.—There is evidence that the blood cholesterol plays an important part by promoting cell proliferation and by combating bacterial invasion.

3.—The test for cholesterol in the blood is not a diagnostic test, but it furnishes valuable information concerning the efficiency of cholesterol metabolism.

4.—The activation of cholesterol metabolism after radium treatment demonstrated by the blood cholesterol determinations, and the parallel improvement of patients suffering from malignancy indicate that there is an intimate connection between disturbances of cholesterol metabolism and malignant disease.

5.—Cholesterol metabolism can also be improved by dietary measures, suggesting that beneficial effects may be expected from dietary measures tending to reduce the cholesterol intake with the food, combined with radium therapy.

6.—Since the life of the cells depends upon their blood supply, the chemical composition of the blood must be equally important; radium treatment changes the chemical composition of the blood, as is shown by blood cholesterol determinations.

7.—Spontaneous cures have been observed in well-authenticated, inoperable, "hopeless" cases of cancer: this proves that the body can wage a winning fight against malignant disease; as therapeutic measures had proved ineffective in these cases, some internal readjustment must account for the cures. Chemical investigations will solve the cancer problem by revealing the nature of this internal readjustment.

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PROBLEMS OF CLINICAL INTEREST TO THE SURGEON AND RADIUM THERAPIST RELATING TO CANCER*

C. Everett Field, M.D., and Robert P. Wadhams, M.D.

Radium Institute, New York City

PLANT life is remarkably influenced by radium emanation. The vine sprinkled with radioactive water, increases its growth almost twofold. A small amount of radium allowed to remain for half an hour in a box of seeds will cause the seeds to germinate much more promptly than control seeds not exposed to radium. Allow 100 milligrams of radium to remain in contact with the seeds ten or twelve hours, and but very few of the seeds will germinate at all—they are dead. Cancer commonly met in plant life can be attacked with radium and its cells destroyed. The stages of its destruction can be checked up by the microscope.

Such experiments to the casual observer may seem unimportant, yet they have proved an incentive to the radium therapist in his study of radiumized tissue, animal and human. It is an undeniable fact that radium rays destroy cancer tissue, and in a manner far more humane than by the surgeon's art. This statement must not bespeak a conflict with surgery, for we recognize in it the greatest weapon of service in the fight against cancer. The best surgery of the world is now being done, and still, in the last twenty years, cancer death rate has increased 30%. To-day we recognize that one in every eight of the women and one in every fourteen of the men must die of cancer: therefore we are called upon to encourage any therapeutic measure that may improve on the present methods. You will bear us out in the statement that there is prevalent among the laity an idea that the surgeon is antagonistic toward non-surgical methods of treatment of cancer. It is important that we correct immediately such an impression because it is not true. The surgeon, in duty to his patient, has been forced to stand out against a multitude of so-called cancer cures, that gain publicity in the secular press. Radium suffers from the unjust publicity it secures when announced as a cancer cure. Such reports exert an influence that works a hardship, first of all, on the cancer victim, secondly, on the general practitioner, and lastly, on the surgeon who is devoting his life to the study of cancer and its control.

Radium to-day is the most potent adjunct that the surgeon can command to strengthen his armamentarium in the battle against cancer. Fifteen years of critical trial has proven this statement: in witness of such fact we see fourteen municipal centres in England with public owned radium, Germany with nine vast radium clinics, Japan with its Imperial Radium Institute, and even the Philippine Islands has a government owned clinic. Recently the State of New York invested in a quarter of a million dollars' worth, for the free use of its people. The surgeon must standardize measures of treatment that are for his support.

At the last meeting of the New York State Medical Society, the surgical section presented no paper on radium: it was not recognized. Recently, at the last session of the American Medical Association, in the section on Gynecology, a prominent surgeon stated that although his "mind was open and he was quite far visioned, he had never seen a single case of primary cancer of the cervix cured by radium." The applause which greeted this statement was so prolonged and enthusiastic that it gave no reason for doubting the attitude of the entire assemblage—more than 400 of America's best surgeons—they had spoken and at the same time acknowledged a degree of ignorance.

Radium has a place: at times it can be used helpfully, and at times its use should be discouraged. The public is informed through the press, and looks to you for advice. That radium does not always control or destroy outlying metastases or new growth advance, must not be charged against radium.

We would have little sympathy with a person who would fail to use specific treatment on the appearance of a chancre simply because he had seen such treatment administered and the primary sore healed, but subsequently, the disease spread like wild-fire. The radium worker is treating cancer, not curing it. He may simply hope to relieve the hemorrhage, the discharge, or influence the pain. The man who cries aloud that radium fails as a cure for cancer, is as a rule the only one who uses that dangerous word "cure." As you would treat the tuberculous case, the nephritic patient, the diabetic, so would we have you treat cancer: give radium where indicated.

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*Address before the Montreal Medico Chirurgical Society, May 20th, 1921.

We would operate wherever possible, if the advantage is for the patient—at the same time we believe that before long you will never operate for cancer removal without instituting pre-operative and post-operative radiation as an adjunct measure.

When radium is applied to a malignant mass in proper and sufficient dosage, very definite changes in its structure are noticed. The first effects of radiation are seen in the vascular supply. There is a stenosis with constant interference with the nourishment of the mass. Next we observe a distinct influence on the cancer cell and the intercellular substances. Radium causes new chemical formations, hastening the processes of deoxidation: almost immediately cell proliferation is inhibited. Although apparently the parent cell nuclei is not destroyed, it is prevented from splitting up into two daughter cells. The function of the cancer cell is exceedingly short-lived in its cycle from birth to death. If it fails to germinate further cells when properly radiumized, it dies, as it were, without an offspring, and the process multiplied, may bring us a complete destruction of an initial cancer lesion. At the same time near and adjacent lymphatic channels may be successfully blocked against metastatic advance.

Radium therapy will be found of necessity, to be a very special study, which finds greatest success in institutional support. It demands the combined efforts of the skilled diagnostitian, pathologist, biochemist, and physicist as well. At present we find no fault with the individual surgeon who wants to supply his own radium, but shortly he will recognize that best results can only follow co-ordinate laboratory check-up.

The multitude of problems that gather around the question of type of growth, its density, and vascularity, must be considered. Anatomic relationships covering adjacent structures are to be well understood. Then comes an intimate acquaintance with the dosage scale of radium and its penetration through the various tissue, together with a knowledge of the power of certain metals, rubber, paper, etc., to act as desirable screens for improper rays. Filtration of ray energy becomes one of the prime essentials of successful therapy. Again comes what we believe to be the greatest of all subjects for consideration, namely, the regulation and control of the elimination and metabolism of the radium case.

With this brief outline of our personal acceptance of radium therapeutic worth, let us consider just wherein it can be advised as justifiable procedure. Our first classification would naturally be operable and non-operable cancer. It is our opinion that all cases of cancer operated should first receive radium or X-ray radiation ten days to two weeks before excision. Inoperable cases quite frequently under radium treatment are again placed in the operable class—this is particularly true for cancer of the uterus. Broadly speaking, the inoperable cancer must be looked upon as hopeless under any measure of treatment, but with radium we produce palliative effects which change the character of the discharge, destroy odor, check hemorrhage, and, at times, to a marked degree, control pain. A tonic influence noted in most cases serves to restore hope again to the patient, that is indeed comforting to those who must continue to minister to the end. If radium failed to cure a single case of cancer, the comfort it affords the inoperable, makes all effort with radium study worth while.

In 1919, in the United States, cancer is credited with a mortality list of 90,000 cases—as many victims as the States had in her entire Service in the Great War. Detailed, the loss would show 40,000, or about 45% to be due to malignancy of the stomach, liver, and intestines. The next group cover the female generative organs and carry a mortality of 20,000. Then follows the head, covering mainly the buccal cavity with 3,500, and finally the purely superficial types that number some 15,000.

Cancer of the head, may of course be of many types, but mainly we divide them into epithelioma, sarcoma and carcinoma. Although general medical opinion is still unfavourable to radium, there seems to be a liberal acceptance accorded for the large percentages of good results shown in superficial epithelioma of the skin and lip. Under improved technic possible with planted radium needles or emanation seeds, we are reaching excellent percentages of clinical cures in neoplasms of the tongue, tonsils, and pillars of the fauces. Bad results are still common in the posterior third of the tongue. The rapidity with which primary cancer spreads by metastases from the tongue and tonsil, to the glands of the neck, make it necessary to give thorough radiation to suspected chains of glands early, followed by immediate surgical removal. The efficacy of radium in superficial epithelial tumours of the skin around the eye is not questioned.

Sarcoma occurring about the naso-pharynx and orbit is often controlled by radiation. The more distant from the glands of the neck, the better the results.

Carcinoma involving the throat showed a discouraging mortality in the larger radium hospitals up to two years ago. Although no cures are reported, we have been able to trace 39 cancers of the larynx treated with radium needles that are alive after 18 months. Cancers of the true and false vocal cords are very resistant to destruction, yet we find them to be seemingly slow in developing metastases. This gives us considerable time to attack it in the primary state. We have had several experiences in which the growth has disappeared under the first radiation, and in four or five weeks again show evidence of activity. A second and a third radiation were followed by a similar return. Cancer is probably only curable when found in its initial stage: therefore the appeal of the surgeon for early recognition is equally important to the radium therapist.

Radiation of the female generative organs furnishes probably the most notable reports to commend radium. There is no form of cancer that offers the possibility of a cure as compared with localized carcinoma of the uterine cervix. Starting as it often does in the borders of an old laceration which has degenerated into a chronic cervitis, it should not escape the family practitioner. Seemingly for several months a neoplasm of the cervix is walled off from advance to the fundus and abdominal glands. Under radiation, favourable results in nearly 30% of cancer of the cervix are conservatively accepted. You are all aware that surgery in such cases shows a far more discouraging record. When cancer of the vaginal walls presents, the prognosis is unfavourable. Involvement of the uterine body brings a conflict of judgment. For the most part we favour thorough preoperative radiation of the pelvic glands and prompt operation. Post-operative use of radium may be also offered. We have already touched on the boon offered the hopeless victim of inoperable pelvic cancer with radium, and we wish further to accentuate this because we are frequently astonished at the wonderful recuperation that frequently follows the introduction of radium therapy. In fairness, we want to speak a warning; when we meet a case far advanced toward the end, who is not suffering much pain or is easily controlled by narcotics, we may well hesitate in urging radium. We have, in a few cases, seen violent pains develop after heavy radiation, that were so agonizing as to beggar description. Any acute or inflammatory processes, of infectious origin in the pelvis serve as a contraindication for the use of radium. The acute will be aggravated, and the chronic cases will be lighted up. Poor elimination, and broken metabolic function follow with such types, and can be recognized by the competent diagnostitian.

Radium applications, within the cervix or intra-uterine cavity are easily made, and standardized dosage is now a matter of record. At times we find it possible to secure better results by fortifying such dosage with a cross-fire application of radium placed high in the rectum, cross-firing to a large amount of radium applied suprapubically. X-ray radiation in conjunction with radium may work very well. With due care there are practically no dangers or contraindication governing the use of radium in uterine malignancies. For our own part, we believe better results will come as we grow bold enough to make one terrifically intensive radiation do the work. A deterrent caution confronts us in the danger that is ever present, of creating a burn which could easily result in a vesico vaginal or recto vaginal fistula.

Malignant tumours of the urinary bladder and prostate offer an increasingly fertile field for radium therapy. Cancers of the bladder show a long and persistent train of symptoms, not infrequently covering three or four years. Indeed they may be recurrent tumours following the removal of some so-called benign papilloma. We are inclined to discredit the word benign: unless cured, they become malignant. Metastasis from tumours of the bladder is slow and gives a long period for curative effort. Brilliant operative work is now done on many bladder tumours where infiltration is not extensive but the mortality is high. We are materially improving the records in all genito-urinary clinics where radium is advocated. Where a suprapubic cystostomy is possible, we advocate the implantation of radium needles or emanation seeds, followed by two or three cross-fire radiations from rectum to suprapubic region. Where operation is impossible, and a cure is not hoped for, palliative results, such as relief of pain and bleeding are commonly met. Application of radium tubes through the cystoscope has been made for several years but its effects have not proven satisfactory. Emanation seeds may, however, be injected through the cystoscope directly into the mass. In this paper, we have attempted no dosage report because we felt that such a statement would be too technical for so general an assemblage.

Before closing we must refer to the remarkable and astonishing results that follow the use of radium in lymphosarcoma and in myelogenous leuchemia. It is not an uncommon experience to see a mass in the neck as big as the crown of a derby hat, disappear in two weeks; almost as startling are the transformations noted in the reduction of the spleen, in leukemias, following the first application of radium. In such cases the surgeon willingly stands back hopeless. Although recurrences or general metastases in the lymphosarcoma cases commonly follow, we are encouraged to feel that radium may, with improved technic, become a cure.

Cancer in the early stage is rarely if ever painful; it closely simulates other diseases and diagnosis by the family practitioner is delayed. The physician therefore cannot be blamed unless he also takes the stand of "waiting further to see what happens." Let us multiply our warnings to the laity relative to any abnormal growth, any source of chronic irritation, and make them aware of the simplicity of caring for such conditions before a danger stage developes. We shall not always agree on all things that are best for treatment, but the profession in general must announce authoritative opinions that will serve to guide the public in the cancer problem.

Endocrinology.—The mere fact that hundreds of physicians and thousands of patients have testified to having profited by the use of this or that endocrine preparation, R. G. Hoskins, Columbus, Ohio (Journal A.M.A., November 5, 1921) says, carries no conviction of its actual value to one who reflects that the pharmacopæias are filled with useless medicaments of which the same can be said. Reports of cures are convincing only when accompanied by adequate evidence that suggestion and other accessory therapeutic measures, as well as mere coincidence, have been ruled out as the determining factors. So long as practitioners fail to realize the essential requirements of scientific evidence and to educate their patients along this line, not only pseudo-endocrinology but also a multitude of other pseudo-scientific cults will continue to flourish. The outstanding fact is that endocrine physiology is largely in a state of uncertainty, whereas the facile applied endocrinology with which we are so unfortunately familiar assumes a large body of substantiated fact. Deductive reasoning, which is the mainstay of a considerable class of self-styled practical endocrinologists, can be productive only when the premises are sound. However probable the existence of numerous circulating hormones, proof of their existence is almost completely lacking The existence of hormonic antagonism remains yet to be proved, however fascinating it is to theorize about. A fantastic theory that has had some currency is that the body cells have a capacity to select from a pluriglandular mixture any hormones they happen to need and to discard the rest. All the evidence is to the contrary. Both clinically and experimentally it is sufficiently plain that the law of mass action has not yet been repealed. To deduce from the unfortunate existing situation, however, the conclusion which certain shallow observers seem to have drawn, that the field of endocrinology itself is merely a mirage, is quite as crass a mistake as to accept as substance every flattering prospect the eye discerns. Endocrinology is one of the most difficult fields of biology. The problems presented are fundamental and quite as fascinating as can be found in any field. There is no easy road in endocrinology, either to discovery or to knowledge already gleaned. There are many problems demanding solution, which require, not genius, but merely accuracy and patience, together with recognition of the ordinary criteria of evidence in any field. What is needed is more work, carefully planned and carried out, less shallow theorizing on the part of those dabbling with the problems, and the consistent but discriminating support of the medical profession. —Journal A.M.A., November 5, 1921.

A STATISTICAL STUDY OF SEVENTY-SEVEN CASES OF TUBERCULOUS MENINGITIS*

Harold McClelland, M.B.

Toronto

THE following is an endeavour to present, from a statistical point of view, the clinical, laboratory and post mortem findings in a series of seventy-seven cases of tuberculous meningitis.

Owing to the scarcity of internes during the period of the war, the laboratory and post mortem findings during the first two or three years of the period covered by these statistics are not as complete as might be desired.

Of the seventy-seven cases, seven were discharged or removed from the hospital, and the result is not known. Of the seventy cases remaining in the hospital, the termination was fatal without exception. Still (1) reports one hundred and fifty cases with no recoveries, but admits that recovery has taken place beyond doubt.

Martin (2) has investigated twenty-one cases of reported recovery occurring since 1894; in these the tubercle bacilli had been found in the spinal fluid, and inoculation of guinea pigs with the fluid produced tuberculosis. In several cases of reported recovery, investigated at various London hospitals, there were none in which the diagnosis was not questionable.

Kerley (3) has never seen any recoveries.

The average duration of illness for the seventy known cases was 19.9 days. The age did not seem to have any particular bearing on the length of the illness, although it is interesting to note the number of cases occurring with respect to age.

1.3 per cent. of cases, one case was under 3 months
15.8 " " " " 12 cases were under 6 months.
24.6 " " " " 19 cases were under 12 months
20.5 " " " " 16 cases were between 1-2 years
37.6 " " " " 29 cases were between 2-5 years
13.9 " " " " 8 cases were between 5-14 years

It will be noticed that about forty-five per cent. of the cases were under two years; the incidence being a little greater during the first year than during the second, only about thirty-seven per cent. of the cases occurred during the three-year period from two to five years. After the age of five the incidence falls off very rapidly. This is in agreement with Kerley's statement, that the greatest number of cases occur during the first three years of life.

A series reported by Still gives results in rather close approximation to our own in this respect.

A history of definite contact with another member of the household suffering from tuberculosis was obtained in 27.6 per cent. of the series.

Symptoms. The earliest symptoms most commonly complained of were, in the order of frequency: vomiting, dullness or drowsiness, convulsions, headache, irritability, and loss of appetite.

Physical signs. The first physical signs most commonly observed in these cases, and in order of frequency, were:—rigidity, disturbed pupillary reactions (strabismus, ptosis, etc.), Kernig's sign, Brudzinski's sign, and paralyses. In infants, bulging of the anterior fontanelle, where this was not closed, was one of the first physical signs to appear. Choroidal tubercles, frequently noted by some observers, were not present in our series. Batten (4) reports choroidal tubercles present in seven per cent. of his series, but makes the statement that they are easily missed in an examination of the fundus.

Blood. There was nothing very significant in the blood findings. The average leucocyte count was about 15,000, ranging from 4,100 to 28,000; the polymorphonuclears constituted on an average 65 per cent. These figures correspond fairly closely with those of Morgan (5). The average count in his series was 20,900. The lowest count 5,400 and the highest 70,000. The polymorphonuclears averaged 72.6 per cent.

Cerebro-spinal fluid. The cell count ranged from 3 to 1,870; the majority of the counts being between 100 and 400 cells. Positive globulin tests (Noguchi) were present in 92 per cent. of the fluids, on which tests were performed. A film was present in 90 per cent. of fluids examined, and tubercle bacilli were found in 68 per cent. of the cases in which a search was made.

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*From the Wards and Pathological Department, the Hospital for Sick Children, Toronto, Ontario.

Forbes (6) found tubercle bacilli in 27 of 47 cases, or in 57.4 per cent. More recently he found them present in 25 of 31 cases, or in 83.9 per cent.

Skin tests. It is interesting to note that tuberculin skin tests were positive in 84 per cent. of cases in which a test was made. During the earlier part of this five-year period, the Von Pirquet skin test alone was used.; during the latter part Von Pirquet and intracutaneous tests were made in each case. In one instance, only, did the tests disagree, the Von Pirquet being negative and the intracutaneous positive.

Kerley (3) reports the Von Pirquet test as being always positive in tuberculous meningitis; Batten (4) states that it is often negative. Our results force us to agree with the latter.

Complications. Complications were present in forty per cent. of the series; these included pulmonary and miliary tuberculosis, acute and chronic bronchitis, broncho pneumonia, whooping cough, otitis media, pyelitis. A diphtheria carrier was found.

Pathological findings. Fourteen post mortem examinations were made. During the earlier years of the war only a very occasional case was autopsied. Of the last ten cases of the series post mortem examinations were made in one hundred per cent. Permission to examine the brain being obtained in eight of them.

A post mortem examination of the organs revealed the presence of tuberculosis as follows:

In the bronchial glands	92.8 per cent.
In the lungs	78.6 “ “
In the spleen	71.4 “ “
In the liver	57.1 “ “
In the suprarenals	50. “ “
In the mesenteric glands	35.7 “ “
In the intestines	35.7 “ “
In the kidneys	35.7 “ “
In the bladder	7.1 “ “

No evidence of tuberculosis was found in the heart or pancreas in any case. Of the eight brains examined, tuberculosis was found in the brain as follows:

About the base	100 per cent.
On the cortex	75. “ “
In choroidal plexus	37.5 “ “

Mention of a primary focus is made as follows:

In bronchial glands	75. per cent.
In mesenteric glands	12.5 “ “
In lungs	12.5 “ “

I am indebted to Dr. Alan Brown, physician-in-chief, for permission to use these records.

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5.—Morgan, E. A., A Study of the Blood in Tuberculous Meningitis, *Amer. Jour. Dis. of Chil.*, March, 1916, 11, p 224.

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Pylorospasm in Adults.—Finney and Friedenwald (Amer. Jour. Med. Sci., October, 1921) discuss the medical and surgical treatment of pylorospasm in adults. The largest number of cases are secondary to some irritative lesion in the stomach, or as a reflex from disease elsewhere —for instance, chronic appendicitis, gall stones, nephritic colic, etc., but a few are purely neurotic without any definite lesion. Symptomatically hunger pains, relieved by emptying the stomach or by taking food, occur two or three hours after meals with palpable stomach contractions, and signs of intermittent stagnation and hyperacidity. It is important to determine whether the lesion producing the spasm is within the stomach or beyond, or whether the condition is purely nervous, and in this connection x-rays are most valuable in differentiating between the types. Medical measures should always be carefully tried before resorting to other methods of treatment, and the underlying neurasthenia should be overcome by change of scene, massage, and rest. Easily digested food at regular intervals should be given, and the administration of olive oil is of service, the attacks being relieved by morphine and atropine hypodermically, hot applications, and lavage. Atropine in full doses, or adrenaline nucleoprotein, are valuable in relief of spasm, but if this is secondary to other abdominal lesions the primary cause should be removed first. The authors conclude that when medical measures fail pyloroplasty gives the most satisfactory results.

HEART BLOCK AND AURICULAR FIBRILLATION

Charles F. Moffatt, M.D.

*From the Wards and Cardiac Station, Royal Victoria Hospital Montreal

HEART Block and Auricular Fibrillation as separate clinical entities are common enough. The gradual establishment of first one then the second condition and their permanent association together is of sufficient rarity and interest to warrant the report in detail.

Clinical History. The patient, a male, aged 62 years first came under observation, December 5th, 1913, being admitted to the Medical Department of the Royal Victoria Hospital for an attack of acute bronchitis. At that time he stated that he had been subject for years to frequently recurring attacks of Winter cough, that lately he had noticed that on exertion he was short of breath and that both legs were swollen. A glazier by trade, he knew nothing of any previous illness. His indulgence in cigarettes was excessive, but moderate in spirits and beer. He denied venereal disease. On examination he presented the appearance of a short, thick-set, grey-haired man, manifestly in distress, cyanosed and dyspnoeic, the dyspnoea being frequently aggravated by prolonged spasms of cough and expectoration. There was distinct cyanosis and clubbing of the finger and toe nails, and a moderate oedema of the legs and ascites. The lungs were markedly emphysematous with hypostatic congestion at both bases, and signs of a general bronchitis. The pulse was regular in rhythm but irregular in volume; there was marked thickening of the peripheral arteries. The heart was enlarged to 15.5cm. in the greatest transverse diameter; the cardiac sounds were distant and at the mitral orifice there was a systolic murmur of insufficiency. There were no signs of pericardial effusion. The liver was tender and enlarged, two finger-breadths below the costal margin. The blood pressure was systolic 140mm. diastolic 100 m.m. The pulse readings were 108 as a maximum but settled down later to a regular rate of 80 per minute. The urinalysis showed a Specific gravity of 1015 and a persistent albuminuria with granulo-hyaline casts. The eye-grounds showed an albuminuric neuro-retinitis. Under treatment he was discharged much improved, December 17th, 1913. In the succeeding months he was able to return to his occupation but increasing weakness and periods of increased dyspnoea on exertion compelled him to rest at home for varying intervals.

He was re-admitted on February 19th, 1915, with the history that six weeks previously he had been seized with a sudden attack of great weakness, dyspnoea and subsequent oedema of his legs and abdomen, and a return of the cough and expectoration. His general condition was very much the same as on the occasion of his last stay in hospital. There was, however, a strikingly slow pulse rate, eighty on the last examination it now registered forty and on several occasions thirty per minute. At times a *well marked venous pulse in the neck recorded double the rate of the radial.* The cardiac signs, both as regards sounds and measurements, were unchanged. An electrocardiogram (Fig. 1) revealed a condition of complete heart-block, February 12th, 1915. Referring to Fig. 1, we find the auricular rhythm is in the main regular, but the inter-auricular periods, where they are interrupted by an intervening ventricular contraction, are shortened. For example, in lead 1 the interval between the 6th and 7th, auricular complexes measures 0.69 secs. whilst that between the 10th and 11th is 0.74 secs. The ventricular contraction appearing to increase the auricular excitability with a disturbance in rhythm(1). It is evident that here the auricular contraction arises independently of the ventricular, at times altering the shape of the T wave, again coinciding with the QRS complex and at all times bearing no constant relation to the ventricular complex. The ventricular rhythm also varies, e.g. the inter-ventricular time relation between the second and third complexes, lead I is shortened and followed by a ventricular complex which is prolonged 0.18 secs. as compared with 0.08 secs. of the first complex.

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*I am indebted to Dr. W. F. Hamilton, under whose care this patient was, for permission to study his condition.

In lead II likewise there is a disturbance of rhythm and an alteration in the ventricular complexes. While their origin is of supra-ventricular type, the distortion would seem to be caused by disturbance in conduction below the auricular-ventricular node. The third lead also shows similar changes both in time relations and conduction. The last three complexes suggesting a lesion of the left bundle branch, with defective conduction down the same. (2). From all of which we can say that there is already complete auriculo-ventricular dissociation and changes in the excitability and conduction of the conducting system below the a.v. node. Atropine gr. 1-60 hypodermically was given but without any effect on the ventricular rate, ruling out a vagus nerve effect. No change in his general condition or in the electrocardiograms was noted until February 29th, 1915, when the pulse became irregular and increased in rate to 45 per minute. vide Fig. 2. A fluoroscopic screen examination at this time showed a general cardiac enlargement with *the auricles beating at twice the ventricular rate.* In lead I. fig. 2. there is a definite two to one block, the ventricle responding to alternate auricular contractions, with a P-R. interval of 0.18 secs. The auricular rate being 83.3 per minute and the ventricular rate 42.8 per min. The irregularity and increase in rate as noted above are explained in lead II.; the ventricle responding to stimuli from above at irregular intervals and with P-R. intervals prolonged to 0.20. secs. In all the leads the QRS complex is prolonged with measurements of 0.21—0.23 secs. and in leads I and III. are seen the wide and notched QRS complexes such as we have been accustomed to associate with right bundle branch lesions (3); or according to other views, arborization block (4). After a week of rest, no other treatment was given, a third electrocardiogram was taken, (Fig. 3.) before his discharge. In this we see the block has passed off leaving a normal rhythm, a pulse rate of 60 per min. and a conduction time of 0.22 secs. which is greater than the usual limits of normal conduction. The characteristic QRS complexes as seen in Fig. 2. are still present. He was discharged in fair general condition, able in a few weeks to continue at his work without very marked distress.

The next three years are very much a repetition of what had gone before; a period of light work; an interval of rest. He was readmitted to hospital in April 1918, with a 2 to 1 block which persisted with ventricular rates of 36 to 48 a minute. The blood pressure at that time was systolic 265, diastolic 100 mm.

In January 1919, a return of his symptoms of loss of compensation compelled him to seek hospital aid. He presented the typical appearance of loss of compensation; dyspnoeic, moderately cyanosed with ascites and oedema, etc. and general hypostatic congestion of the lungs. The pulse was slow, 48 per minute, but regular. The pressure was systolic 240, distolic 90. The heart was dilated with a transverse enlargement of 22.2 cm. The cardiac sounds were very distant. The aortic second sound was accentuated and followed by a soft diastolic murmur of insufficiency this was the first time this condition was noted, also a capillary pulse in the finger nails. A blood Wasserman test was negative. The electrocardiogram taken on admission presented an entirely different picture. Vide Fig. 4. There is the same left-sided preponderance, the same right bundle branch lesion, but no evidence of a regular co-ordinate auricular contraction. The auricular deflection is replaced by a series of small diphasic waves, marked 'f', which are taken to represent auricular fibrillations. An important point to note is that the ventricular rhythm is regular at a rate of 48 per. minute. Now if the auricles are fibrillating an absolutely irregular rhythm is to be expected. For such a combination as was now present there must be a complete block between the auricles and ventricles with the ventricles initiating their own rhythm, idio-ventricular rhythm.

From this date on the block seems to have become established, as all subsequent tracings present the same general features, vide Fig. 5, taken October 25th, 1920; in this the auricular fibrillation is more distinct. In Figs. 4 and 5. the same fibrillation feature persists. But in leads I and II of both tracings the ventricular deflections are in reverse directions. In Fig. 4, the direction of the ventricular deflections in leads I and III point to a right bundle branch lesion (3). The altered deflections in Fig. 5 seem to indicate a transitory stage between that seen in Fig. 6. where the QRS complex, lead III has again reversed, which feature in association with the corresponding deflection, lead I, would represent a left bundle branch lesion; both bundles of the conducting system being in turn involved. (5)

The clinical history of this patient taken in conjunction with the graphic records, illustrates very clearly the gradual but surely progressive nature of a myocardial invasion.

The first knowledge we have of him is in 1913 with the complaint of acute bronchitis, which was apparently caused by, and served to mask, a myocardial lesion quite advanced even at that time. In 1915 a complete heart block occurred but was not yet permanently established; in 1918 a persistent 2 to 1 heart block; in 1919 a complete and permanent heart block complicated with an auricular fibrillation.

The very decided increase in the cardiac diameter with very pronounced rises in blood pressures are also noteworthy features; in 1913, 140 systolic, 100 diastolic; in 1918, 265 systolic, 100 diastolic; in 1920, 280 systolic, 110 diastolic. Coupled with this the increasingly shorter intervals of freedom from symptoms and the marked restriction of the field of cardiac response, point clearly enough to a progressive condition.

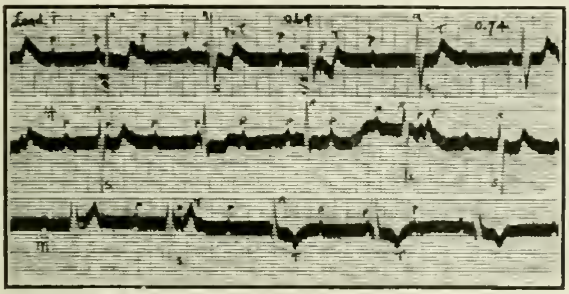

FIG. 1.—February 12th, 1915. Complete heart block; auricular rate 90, ventricular rate 42.8; left sided preponderance. Note changes in QRS complex in both direction and shape.

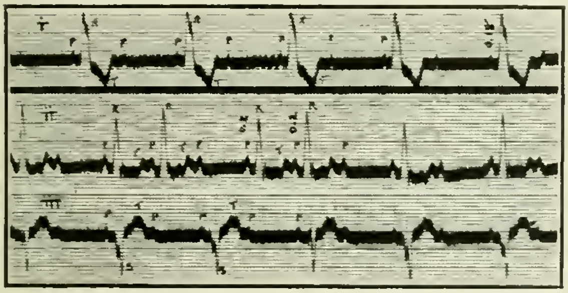

FIG. 2.—February 29th, 1915. Partial heart block; in first and third leads 2-1 block; second lead irregular block. Note characteristic split QRS complexes in first and third leads—right bundle branch lesion.

Conduction time lead i-0.18 secs: lead ii-0.20 secs.

The ordinates represent one-tenth millivolt each, the abscissae 0.2 secs.

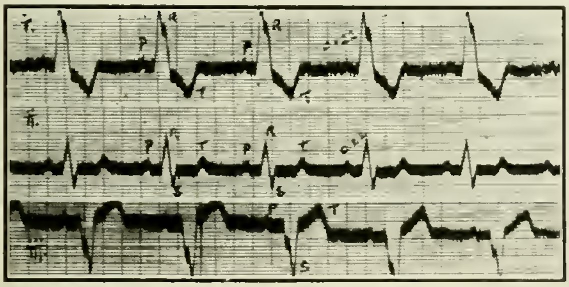

FIG. 3.—March 8th, 1915. Normal S-A rhythm, block having passed off. Prolonged P-R conduction time 0.22 secs. Characteristic ventricular complexes of right bundle branch lesion.

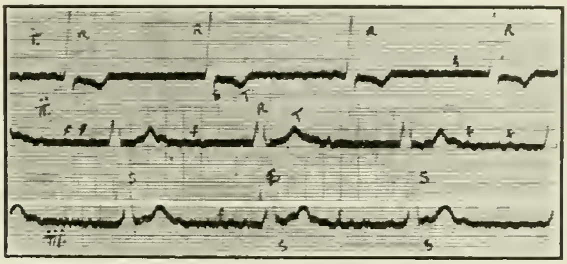

FIG. 4.—January 8th, 1919. Absence of auricular complex. Auricular fibrillation with a regular ventricular rate—complete auriculo-ventricular dissociation.

Ordinates represent one-tenth millivolt; abscissae 0.2 secs.

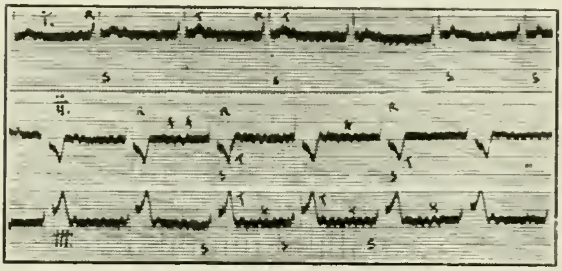

FIG. 5.—October 25th, 1920. Auricular fibrillation with heart block; fibrillation waves marked 'f'; note the change in the direction of ventricular complex leads, I and II. as compared with FIG. 4. due to conduction changes in the bundle of His.

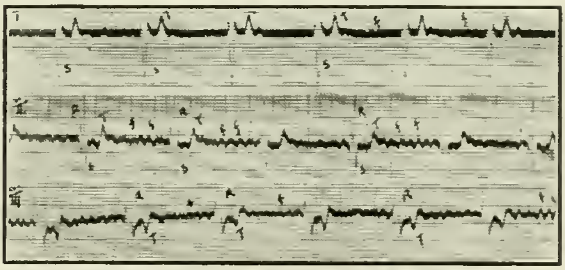

FIG. 6.—January 17th, 1921. Auricular fibrillation and heart block. The QRS complex, lead iii. has changed to an upright deviation suggesting left bundle branch lesion.

Ordinates represent one-tenth millivolt, abscissae 0.2 secs.

Similarly, but with more detail as to the structures involved, the electrocardiograms show first a complete heart block, under the influence of rest, passing to a normal rhythm but with a damaged conduction system. The next stage shows a permanent 2 to 1 block which eventually passes over into complete auriculo-ventricular dissociation; and finally the added complication of auricular fibrillation.

Now although complete block is quite common, it is rather remarkable that the auricles being completely cut off from the ventricles should not more frequently go into fibrillation, considering the very widespread myo-cardial damage that appears to be present. However, this unusual combination has occurred here as borne out by all the evidence. When we come to consider the actual anatomical lesion, the similarity of clinical signs to a case reported by A. E. Cohn and T. Lewis (5) is so striking, that until the opportunity presents itself for a minute examination, we are inclined to assume similar lesions in this patient. In the former case there was a distinct syphilitic infection, in our case such is not present. In the postmortem findings reported by these two physicians, there was, in addition to an extensive interstitial fibrosis of the cardiac muscle, destruction of part of the sino-auricular node by fibrous tissue invasion; destruction of the muscular connection, auricle to A.V. node; a severance of the main stem of the bundle of His below the A.V. node; and a destruction by invading connective tissue of both the right and left branches of the bundle where they join the main stem. When last seen in July, 1921, this patient was fairly comfortable and in a fair state of compensation, able to walk about the house but no more. The blood pressure at that time was systolic 280, diastolic 110. The state of fibrillation and heart block still persisted.

SUMMARY

1.—The gradual progressive stages of a case of chronic myocarditis on to first a partial heart block then a complete auriculo-ventricular dissociation are presented.

2.—As the lesion progresses, in addition to the permanent heart block a state of auricular fibrillation is added.

3.—The probable anatomical lesions are discussed.

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Decapsulation in Renal Disease.—Rovsing (Hospitalstidende, August 24, 1921) has performed decapsulation of one or both kidneys in 77 cases of renal disease, and is satisfied that in a large proportion of cases this operation can restore to complete health patients who would otherwise be doomed to early death or chronic invalidism. His opinion of the operation is so favourable that he recommends it in every case of nephrosis which does not react satisfactorily to medical treatment. In itself the operation is not dangerous, and it is technically easy to perform. When he finds the capsule of the kidney fairly normal, the author simply strips it off the kidney up to the hilus. But when he finds the capsule very fibrous and thickened he excises it. He reminds the physician that chronic nephritis is comparatively often unilateral, and that it is therefore always advisable to catheterize the ureters when cases of nephritis are investigated. He has found that in most cases of interstitial nephritis characterized by attacks of hæmaturia and pain complete cure can be effected by decapsulation. Indeed, all his 26 cases of interstitial nephritis and perinephritis, associated with attacks of pain and hæmaturia, but without albuminuria in the intervals between these attacks, were cured by decapsulation. His least satisfactory results were obtained among cases of small granular kidney in an advanced stage. But even in these cases headache, nervousness, lassitude, and inability to work often passed off completely, and the albuminuria disappeared or was markedly reduced. The good results achieved in cases of orthostatic albuminuria were probably due to fixation of the kidney in its normal position by the operation: the same result can, however, be obtained by the support to the kidney effected by well-fitting bandages.

SEPTIC ABORTION*

O. A. Cannon, M.B., F.A.C.S.

Hamilton, Ontario

An abortion is the interruption of pregnancy before the child is viable. The term premature labour should be used to designate those instances where pregnancy terminates before maturity but after the child has a chance to live. In scientific description it is better to discontinue the use of the term "miscarriage," which is used by the laity to apply to the interruption of pregnancy at any period before full term.

A septic abortion will have the same suggestive clinical manifestations as an a-septic one, with the addition of the findings associated with an infective process. At times this infective process may arrest or modify the symptoms which we consider to be the characteristic phenomena of abortion. Then, again, evidence of contamination may appear at any stage of the abortion process and even after its completion, depending upon the time infecting organisms entered the body and also upon the dormant period of these organisms.

Causation. Abortion is brought about by causes associated with either the fœtus or the mother. Disease or malformation of the fœtus or its appendages may result in its expulsion. In the mother, syphilis or other infectious disease, toxæmia of pregnancy or toxæmia from anæsthesia, alcohol and drugs; mental disturbance, abortifacients, local pelvic disease, particularly chronic endometritis and malpositions of the uterus, are all possible and frequent causes of abortion. The greatest etiological factor is, however, criminal interference either by the pregnant woman herself or by the abortionist. Of fifty-one women attended by me during abortion, twenty-two admitted criminal interference. This percentage of forty-three would have been materially increased if all the patients had been equally frank.

The process may be rendered septic in two ways, speaking very broadly: the infection may have its origin within the body of the patient, or on the other hand it may be introduced from without. Polak (1) regards the uterus during involution as a wound. Certain it is that when the placenta or decidua separate from the uterus a wound is the result. This wound is bathed in blood and forms at once a splendid culture medium as well as an avenue of entrance for any bacteria which may reach this situation. It is possible that the organisms may be carried in the blood from a focus of infection remote from the pelvis. The teeth sockets, the tonsils, the accessory nasal sinuses, the gall bladder, may harbour bacteria which often escape into the blood stream. It is possible that the puerperal wounds may thus be infected endogenously. Every writer on this subject suggests this method of infection, but satisfactory clinical and laboratory proof is lacking. The role played by focal infection in the production of toxæmias of pregnancy has long been suspected. Recently Talbot (2) from a clinical study of the placenta finds evidence of blood-borne infection in that organ. Rosenow (3) in his study of the elective localization of bacteria in certain lesions found that when a pregnant rabbit was used in the experiments the lesions were produced in the fœtus of the same character as those in the parent rabbit. Infectious infarcts in the placenta and infections produced in the fœtus go a long way toward establishing the possibility of the infection of puerperal wounds by blood-borne organisms. Further work along the lines indicated by Rosenow (3) ,(4) will doubtless solve this problem. There is, however, a method of autoinfection about which it is not necessary to speculate. Latent or active infective processes may be located within or in close proximity to the genital tract. The vagina under ordinary circumstances contains a varied bacterial flora which although apparently innocent there, if carried to the fresh wounds above may set up a serious infection. Many suffer from leucorrhœa from chronic infection of the cervical or vaginal mucosa, or of the deeper glandular elements of the cervix or vulva. The presence of the gonococcus in the vagina is a more serious circumstance. All are familiar with the tragic sequence of events which frequently follow abortion or labour in those who suffer from gonorrhœa. If the patient's life is spared, years of suffering are probably ahead of her, with sterility and mutilating operations in addition. Certain authors stress the importance of the male fluid in the vagina as an important factor in the causation of infection. Bathing has also been held responsible for the entrance of germs into the birth canal to infect puerperal wounds.

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*Read before the Medical Societies of Perth and Oxford Counties, Lakeside, Ontario, June 29th, 1921.

Autoinfection is, doubtless, assisted by the general condition of the patient, she being often particularly susceptible to infection from the severe anæmia and shock of the abortion or from some concurrent condition.

The introduction of infected material from without is, however, the cause in the great majority of cases. DeLee (5) considers it to be proper in all cases of septic abortion to suppose that the abortionist has been at work. Most authorities agree that a very large proportion of these cases are due to the work of the abortionist or to the patient herself. In the author's series of thirty-one cases which forms the basis of this study, fifteen of the patients admitted criminal interference. The abortionist does not make adequate preparation of the parts, the hands, or the contrivances. The work must, perforce, be done secretly, which presages the fact that the operation is undertaken without assistants or proper preparation. The abortionist must have no witnesses to his deed. Holmes of Chicago holds that all criminal abortions should be treated as septic until the clinical course proves otherwise. The abortionist is realizing the importance of asepsis as is evidenced by the fact that of twenty-two cases of admitted criminal abortion in my series, seven did not become septic.

Regrettable as it may seem, the physician or nurse may be the party responsible for the infection. Unclean hands, faultily prepared dressings, packing and instruments, or carelessness in the toilet of the patient may be the causative factor. In this connection the proximity of the orifice of the bowel must ever be regarded as a potential danger, and all means taken to prevent material from the bowel entering the genital tract. This is perhaps more important in labour at maturity, where the advance of the presenting part expresses from the bowel material which may reach the inevitable wounds caused by the trauma of birth. Bonney (6) gives it as his opinion that too little attention is given in all obstetrical procedures to the isolation of the anal region from the field of operation, and perhaps too much stress given to the possibility of infection from without. An improper technique may be responsible for the transplanting of bacteria from the vagina or vulva to a higher position in the genital tract, where they have an opportunity to invade. In infected cases one should bear in mind that the patient may be infected by one organism in pure culture, and that in order to prevent a mixed infection the preparation and technique must be just as thorough.

Symptoms. Added to the phenomena of abortion will be noted a rise of temperature often preceded by a quickening of the pulse. If all cases of abortion are put on a two-hour pulse and temperature chart one is frequently able to discover that all is not well with the patient long before she has symptoms. Throughout the disease the pulse is a more reliable guide to prognosis and treatment than the temperature. A rising pulse rate unless associated with a corresponding rise in temperature is an ominous sign. The temperature may rise to 105 or 107 and fall as suddenly. In other cases it may show a steady daily rise; and in still others it may never go above 101, even although some of such cases may terminate fatally. The temperature does not indicate whether the infecting organism is a benign saprophyte or a virulent streptococcus. One's equanimity need not be much disturbed if the pulse rate remains low, even when the temperature is very erratic. Chills and chilliness are usual. Repetition of chills indicates fresh invasions. Pain is usually not complained of until the peritoneum is reached except in cases of acute congestion of the pelvic organs. An increase in the white blood count is usual, and Polak (7) uses this symptom as his indication for surgical interference. In the writer's series it was noted that in four patients severely ill there was a leucopenia. One of these died.

Lochia. Over and over again it has been stated that because there was no odour to the lochlia that there was no infection of the genital tract. As a matter of fact, in streptococcic infections it is extremely characteristic for the normal musty odour to disappear. In sapremic infection the lochia is usually very offensive and profuse. A scanty discharge without odour leads one to suspect that he is dealing with a systemic invasion by the streptococcus or other organism.

Diagnosis. The fact of a septic abortion is determined by exclusion as in the diagnosis of any other pathological condition. Any one of all the conditions manifested by a thermal course may either be the cause of the abortion or concurrent with it. It is the height of folly to attempt any radical treatment until it is definitely and positively determined that the illness is due to infection within the pelvis. Holmes of Chicago states that while on the abortion committee of the Chicago Medical Society he had opportunity to observe many instances where cases came to autopsy with a diagnosis of death from puerpural sepsis and in which the pathologist discovered no evidence of pelvic disease but did find such conditions as pneumonia, brain abscess, and acute abdominal conditions. One should be loath to discourage thoroughness in diagnosis, but little if any good so far has resulted from the identity of the infecting organism. If the blood culture shows a growth the prognosis is more serious, but whatever germ is found the treatment remains the same, most authorities being frankly pessimistic in regard to vaccine or serum therapy in this condition. One cannot help feeling that in this direction lies truth; but let us leave it to the trained path-finders to show us the way, and let us not follow the many "will o' the wisps" which in such distracting profusion would lure us from the thoroughfares of sound therapeutics. An admission of gonorrhœa or the possibility of infection by the gonococcus is however an indication for bacteriologic examination of the discharges, as the presence of this organism is a mandate to leave the woman severely alone as far as local treatment is concerned.

Prognosis. Nature attempts and usually succeeds in limiting the process by means of an enveloping reaction zone. This may vary from a superficial infiltration of the endometrium with white blood cells to a very extensive inflammatory process deep in the tissues. When the infecting organism is virulent there is apparently no time for nature to complete her protecting wall. In such cases at post mortem there is often astonishingly little evidence of tissue reaction, and the necrotic layer lining the uterus where the infection entered may be entirely absent. This white lining of the uterus is found in most cases of septic abortion and indicates nature's effort to repel the invader at the threshold. Prognosis will be influenced by the virulence of the infecting organism and by the dosage, the immunity, and general health of the patient, and upon the treatment she receives. It also seems logical to suppose that a woman whose pelvic organs were healthy previously will do better than one who has chronic disease there. That treatment avails much is doubted; but let us at least refrain from increasing the helpless woman's difficulties by ill-advised interference.

TREATMENT.

Prophylaxis. The best treatment of any condition is its prevention. Abortion can be prevented in most cases. To the public health worker we freely offer our tribute of praise for his magnificent accomplishments along many lines. The reduction of infant mortality, the control of venereal disease, the improved living conditions in the homes of the people, and the reduction of the death rate from infectious diseases are results due to the tireless efforts of the physicians charged with the administration of public health affairs. The prevention of abortion is a phase of their work which has as yet received very little serious attention, and any activities undertaken have not been pushed with vigor. The birth rate would be very materially increased if the slaughter of unborn children could be prevented. Many women are losing their lives and many others becoming economic burdens through chronic invalidism following abortion. DeLee (8) says that prognosis as to health is worse after abortion than after labour at term. To give a personal experience, I have attended during a certain period three hundred and fourteen women in labour at term, while during the same period I was called to fifty-one cases of abortion. Thus over fourteen per cent. of my cases aborted. This experience will no doubt approximate that of others, and will give an idea of the serious loss of life from this cause. A great deal can be done to prevent the condition and the following suggestions are put forward for consideration.

The influence of wide publicity has long been recognized as an effectual method of bringing about reform. One need only refer to the campaign against venereal diseases which has made everyone acquainted with these conditions, and by public co-operation has enabled the health authorities to get them under control. A similar campaign in which cold facts about this condition are given the widest publicity, the statistics quoted, the causes of abortion enumerated, and expectant mothers counselled to put themselves under medical supervision at once, would most surely result in a marked reduction in the number of cases. The mere publication of the Criminal Code of Canada as it pertains to abortion could not help but have a deterrent effect on those guilty of improper practices. Its penalties are generous. Life imprisonment is prescribed for one who administers drugs or uses means to produce an abortion. If the woman herself is guilty the penalty is seven years' imprisonment. The most significant section reads as follows: "Everyone is guilty of an indictable offence and liable to imprisonment for life who causes the death of any *child* which has not become a human being in such a manner that he would have been guilty of murder if such a child had been born." The moral conscience of the public, including that of some physicians, needs educating, and it should be some one's business to make it known that from conception the unborn child is a human creature whose destruction is the equivalent of murder. If the public were in possession of all the facts they would join in hunting down criminal abortionists as they do in the case of other malefactors. At present they flourish and enjoy a certain immunity owing to the apathy of the public toward their crime.

The medical profession has also a duty in this connection. Evidence against the criminal abortionist is often obtained, and while the violation of the confidence of patients is not to be considered it is possible by discreet communications to the local officers of justice to rid the community of the obnoxious person.

The medical man himself should shun the very appearance of evil. Sympathy with the unfortunate woman who for any reason finds the circumstances of pregnancy a hardship should never cause him to suggest that it were better that her pregnancy be terminated. She would probably seize upon this suggestion and use it to salve her conscience in further search for help. A firm, tactful refusal from her family physician will in most cases put the idea out of her head.

To make it more difficult for a woman to operate on herself it should be enacted that druggists are not to sell without a physician's order such articles as male catheters and sponge tents. Ergot, cotton root, and other emmenagogue compounds should similarly be withdrawn from sale except when prescribed. Slippery elm which was used in two of my cases would make just as good tea if the druggists were required to cut it up into small pieces before offering it for sale.

The registration of the birth of a "child" at any stage of pregnancy would have beneficial effect. It would insure that proper statistics were obtained and the seriousness of the loss of life from this cause would be known. It would also be a decided check on the criminal cases.

The prenatal care received by most pregnant women is practically valueless. Many do not see the doctor until he comes to attend them in labour. Others go to "engage" him and see him no more until labour. The doctor may ask for samples of the urine, and he may not. A maternity engagement should be considered a serious matter. The patient's history should be carefully taken and a complete physical examination made on her first visit. The blood should be examined in every case. The urine should be examined and the blood pressure taken every two weeks throughout her pregnancy. The woman should be instructed in the care of her body during her pregnancy and should be taught to recognize the abnormal indications and to seek help when they appear. All this will take time and to the busy practitioner it may not seem very necessary. The satisfaction of preventing one abortion or of saving one woman from eclampsia will amply repay one for much routine work. An engine driver who refused to watch for his signals would not be considered a safe man to pilot the engine, and an obstetrician who does not watch his patient carefully for the onset of difficulty is likewise unfit for his work. Then again, the public are slowly becoming educated to the importance of prenatal care, and the practitioner who fails to satisfy in this regard will be passed by in favour of his more conscientious brother. Of course it is understood that this prenatal care must be properly recompensed, and for those who cannot pay for the service, prenatal clinics should be established in every centre where this care can be obtained without cost.

Treatment. The treatment of septic abortion may be: (1) Radical—operative; (2) Conservative—expectant. In increasing numbers the leading authorities in obstetrics are becoming exponents of the latter method. He who would curette, douche, or practice any of the methods of intra-uterine therapy as a routine will lose more patients than he who treats his patients purely expectantly. Williams (9) one of the earliest advocates of conservative treatment, had a mortality of 4.35 per cent. in 1899, while his contemporaries were treating their patients actively with a mortality as high as 30 per cent. Hillis (10) reports an interesting study at Cook County Hospital, Chicago. In order to test the efficacy of the two methods of treatment and to reach a definite conclusion, a clinical test was made. Women brought to the hospital suffering from septic abortion and with a temperature of over 100 were assigned alternately to active and to conservative treatment. Those on the active list were immediately curetted. The figures were as follows:

	Active	Expectant
No. of cases	100.	100.
Days of fever	810.	350.
Average days of fever	8.1	3.5
Total days in hospital	1328.	848.
Average days in hospital	13.28	8.48
Complications	19	4.
Deaths	3.	1.
Percentage mortality	3.	1.

In my series of thirty-one cases of septic abortion, one only was treated actively and this patient died. In her case criminal interference was admitted, and after a long period of expectant treatment the uterus was curetted owing to the continuance of a fairly brisk hæmorrhage. Her temperature before operation did not rise above 100 but did not continue normal. She also vomited occasionally. The curette should not have been used. Packing would have emptied the uterus without as much danger. Thirty-six hours after operation she had a severe chill with an acute rise of temperature. She died in four days with acute bacteremia. The thirty cases treated expectantly recovered promptly with the exception of one who developed a double salpingitis and in whose case a history of gonorrhœa was obtained.

Operative treatment by curettage, digital removal, tamponade, and douches is in each case open to the same objection. It is ineffectual more often than not failing to remove the products of conception, and is in itself a source of danger. The curette is especially harmful and it is doubtful if a thorough curettage of the uterine cavity was ever done. Its configuration is such that it is impossible for the scraping edge to cover more than half the surface. It is true that gross particles may be removed, but it is never possible to be sure that the uterus is empty.

Many authors report cases in which pregnancy has gone to term after what was thought to be a thorough curettage of the uterus. A few weeks ago I was associated with a skilful obstetrician in a case of pernicious vomiting of pregnancy. Interruption of pregnancy was the decision of counsel. My colleague dilated and packed with gauze. The patient did not abort. She was again anæsthetized and curetted. It was thought that the products of conception were removed completely. Some days later she passed a large decidual mass. Besides being an ineffectual instrument it is a dangerous one. Perforations are frequent with its use. The soft friable uterine wall may give way under the gentlest movements of the curette. The most formidable objection to its use in cases of septic abortion is that even with the dullest instrument and the softest strokes new wounds are made and the spread of the infective process is likely to result. DeLee says "My experience has taught me that the traumatism of curettage, digital or instrumental, may be fatal—a superficial and not dangerous infection being converted into one with strong invasive qualities." If the symptoms are due to infected uterine contents, nature can usually be relied upon to empty the uterus in due course. Their retention in the uterus can do no harm. The organisms in the mass may be leading what is practically a saprophitic existence. To employ an instrument to remove them may give these organisms an opportunity to actively invade. Fothergill (11) speaks of using the curette before the pathogenic organisms have entered the blood stream. If the infection is due to a virulent organism it is far beyond the reach of the curette by the time symptoms appear.

The following is the treatment suggested: The patient is put to bed in the Fowler position, seated upon a sling pillow. She is better in a hospital, where she can receive skilled care and be shielded from visitors and annoyances. She should be put on a two-hour pulse-temperature chart. Water and nourishing fluid diet should be given in abundance. The bowels are opened by enemata and gentle laxatives. An ice bag is placed over the lower abdomen. If fluid is not taken freely by mouth glucose or saline solution is given per rectum; or if not tolerated there, by subcutaneous injection. Appropriate stimulation is given if required. Ergot or pituitin are used to keep the uterus in contraction. This probably blocks lymphatic channels. Quinine is often useful to remove retained products of conception. After the temperature has been normal for five full days and the uterus is not empty, the contents should be removed. The patient's return to health is thus expedited.

Should hæmorrhage have to be reckoned with during the course of septic abortion, the following procedure is recommended: With the patient prepared for operation, with plenty of assistants and if possible without anæsthetic, pass the largest sized tubular cervical speculum that can be got in and through it pack weak iodoform gauze with blunt dressing forceps. Then about the cervix pack sterile cotton layer upon layer until the vagina is full. In twenty-four hours the packing is removed and with it is usually found the products of conception.

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OBSERVATIONS ON THE VALUE OF LUMBAR PUNCTURE

A. HOWARD MACCORDICK, M.D.

Physician to the Out-Patient Department, Montreal General Hospital. Pathologist to the Western Hospital.

LUMBAR puncture has long been recognized as a measure not only of great diagnostic value, but also of considerable therapeutic benefit. The information derived from the examination of the spinal fluid, and the relief experienced on its removal, is, we believe, greatest in the acute inflammatory conditions, such as septic meningitis and epidemic cerebro-spinal meningitis. To these we may add also the tuberculous meningitis. Our present laboratory methods enable us in these acute conditions to make a diagnosis so easily that it would seem little could be added from the laboratory standpoint.

The varied characteristics, however, of the spinal fluid in certain more or less obscure cerebrospinal conditions and their relation to the blood findings in the same patients, seem to be sufficient excuse for the presentation of a few figures, gathered from the study of 130 examinations of the spinal fluid made in connection with the work of the medical departments of the Montreal General Hospital and the Western Hospital during the past four and a half years.

Laboratory methods for estimating increase in the number of white cells, or increase in the amount of globulin, have become very accurate, and have enabled us to detect the slightest evidence of acute or chronic inflammatory reaction. Add to these tests the serological reactions, and we have further enhanced our methods of diagnosis. In spite of all our tests, however, the clinician may at times find great difficulty in arriving at a definite conclusion in cases showing symptoms of lesions of the central nervous system or cord, in fact at times he may not only be helped *little*, but may actually be *misled* by the laboratory findings.

This study has been confined to conditions, for the most part, purely medical, or cases met with in the medical wards and outdoor clinics. It consists of observations on the spinal fluid findings in cerebral hæmorrhage, cerebral thrombosis, cerebral lues, encephalitis lithargica, poliomyelitis, brain tumour, brain abscess, tabes dorsalis, myelitis and so-called meningismus. The findings have been of interest not only from a medical and a scientific point of view but also from a medicolegal aspect. Several cases have come under observation in which a definite diagnosis was necessary, in that men have taken actions in law courts to recover damages for disabilities which they attributed to accident. Others have arisen in which the obligation to pay insurance was questioned by the company.

Here may be cited two illustrative cases:

R. S., male, age 38, employed as a laborer, fe from a scaffold while at work. He sustained what appeared to be severe injuries and instituted action for damages. The doctor representing the company having insisted on a lumbar puncture, obtained a spinal fluid showing an increased cell count, a positive globulin reaction, and a positive Wassermann (a blood Wassermann in this case was also strongly positive). It seemed evident then that this man's disability was due to cerebro-spinal lues, and not to his accident, a point impossible to settle without a lumbar puncture.

S. C., age 60, was noticed to have walked home from work on three or four successive evenings with a slightly staggering gait. On the last evening, on reaching his home, he fell down five or six steps, striking his head on the pavement. He was taken to the hospital, where a diagnosis of fractured skull was made. He was operated upon, the skull trephined, a bleeding middle meningeal artery secured, and large clot removed. In spite of an apparently successful operation, however, the patient slowly sank and died. On application to an insurance company in which the man held a policy, payment was refused on the grounds that death was due to a fractured skull as the result of intemperance. The surgeon who performed the operation considered that under ordinary circumstances the man should have recovered, and asked for an autopsy. Post mortem examination revealed a fracture of the left anterior fossa, while on the other side of the cerebrum there was a hæmangioma involving the right tempero-sphenoidal lobe, and the inferior surface of the right frontal lobe. The latter was evidently the cause of his staggering. Lumbar puncture in this case gave bloody fluid. It would, however, in all probability have given bloody fluid had there been *no* fracture. The findings in the spinal fluid in such cases may be misleading.

These are examples of what may be considered the exceptional. However, in the majority of cases fairly definite conclusions can be drawn from the findings in the cerebro-spinal fluid, as will be seen from the following figures:

Disease	No. of Cases	Blood Wassermann Percent Positive	Spinal Fluid Wassermann Per-cent Positive	Percent of Cases showing increased white cell count	Percentage of cases showing an increased Globular Reaction
Cerebral hæmorrhage......	4 32	4 0	6 0	6 81	6 8
Cerebral thrombosis.........	19	4	19	44	44
Cerebral lues....	29	81	65	90	64
Encephalitis Lethargica....	15	25	0	93	64
Poliomyelitis....	10			90	100
Tabes dorsalis...	12	50	57	70	80
Cerebral tumour.	5	0	0	100	100
Cerebral abscess.	2	0	0	100	100
Myelitis........	2	50	50	100	100

It will be noted then that lumbar puncture in these conditions may give a great deal of information regarding diagnosis and treatment, as well as marked relief to the patient, by relieving intra-cranial pressure. This relief of pressure is especially beneficial in sleeping sickness, abscess and tumour cases. The operation, however, should not be done promiscuously. The unpleasantness to the patient, the risk of infection (which however is slight), and the degrees of harm arising from suddenly decreasing intra-cranial pressure, should make it a measure to be regarded as demanding caution. For the purpose of diagnosis no more fluid should be withdrawn than is absolutely necessary. A complete examination consisting of cell count, globulin tests and Wassermann reaction may be made from an amount not exceeding four to five c.c. of fluid. The removal of this volume will not materially change the intra-cranial pressure. In our series of cases it was noted that only fifty per cent. of those suffering from cerebral hæmorrhage showed blood-stained fluid at first, a point in favour of drawing off only a limited amount of fluid. We notice again that in the cerebral lues cases only sixty-five per cent. gave a positive cerebro-spinal fluid Wassermann, a figure considerably less than has been found by some investigators. Another point noted is the similarity between the findings in the spinal fluid in poliomyelitis and encephalitis lethargica. During the epidemic of poliomyelitis in 1916, we found cases of the so-called encephali type in which there was marked cerebral congestion and even bleeding into the sub-dural space. In studying encephalitis lethargica we also find cases in which there is an acute, extensive cerebral congestion, with blood in the spinal fluid. Considering these similarities in the spinal fluid and the fact that the pathological lesion in each is indicated by a peri-vascular round-celled infiltration, we may in time find a definite relationship between these two, clinically different, diseases. At all events, the examination of the spinal fluid in these two conditions must be considered only as an *aid* in the differential diagnosis.

In a few instances, a clear but slightly red-tinged fluid was obtained, having an increase of white cells and globulin, but a negative Wassermann; microscopically no red cells were found, but a positive reaction for occult blood was obtained. This peculiar fluid was noted in cases of tubercular meningitis and of hæmangioma. In such it was only with the finding of the bacilli in the fluid that the early distinction could be definitely made. Two or three cases have also arisen lately in which from the early clinical symptoms it was difficult to distinguish between encephalitis lethargica and acute tubercular meningitis. Lumbar puncture in each case gave a fluid the cell count and globulin of which might have been obtained from either infection. A puzzling condition marked by meningeal symptoms may at times arise in acute infectious diseases, such as scarlet fever and mumps. In these cases lumbar puncture may show a fluid under pressure in which both cells and globulin are increased. In one instance these findings were not only present, but a pneumococcus was found both in smears and cultures. The fluid, however, in this case gradually became normal as the patient recovered. Such findings would seem to be due to the general systemic infection rather than to a true meningitis, as the first spinal fluid drawn would indicate. Other cases might be cited in which the laboratory reports after lumbar puncture would have been misleading without careful consideration of them in the light of the clinical symptoms.

In conclusion it may be affirmed that lumbar puncture carefully and aseptically performed may be regarded as a safe operation affording us much information, and in a measure that should always be made use of in cases showing symptoms indicative of involvement of the central nervous system. At the same time, it is to be remembered that the results obtained by the laboratory examination of the fluid must in all cases be considered only as an aid in our diagnosis.

Cancer Phobia.—An inevitable accompaniment of directing special attention to any disease is to arouse in a certain number of persons phobias almost as terrifying as the diseases feared. To warn the public that "moles, excrescences, fistulas and warts" "are the first signs of cancer" is to erect a spectre capable of shattering even a normal mentality. To say that "symptoms of indigestion" are "signs of cancer" is so small a part of the whole truth that it is better left unsaid. Carcinoma is in the beginning a local disease. It is definitely known that irritation of tissues favour its production. There has also been accumulated evidence as to the earliest signs by which malignant growths manifest themselves. It is well to give the public such facts as these, to advise early consultation with the family physician, and to point out that we have thus far but one sure method of treatment, and that is complete removal of the dangerous growth. The condition itself is sufficiently serious and needs no elaboration as to its terrifying aspects. Give the public all the facts—but facts only.—*Jour. A.M.A.*, October 29, 1921.

Wiring and Electrolysis for Aortic Aneurysm.—Sailer (Therap. Gazette, October 15, 1921) from an experience of sixteen cases, considers that the treatment of aortic aneurysm by wiring and electrolysis deserves more consideration than is usually given to it, and records a case, aged 44, treated three years ago, in which immediate improvement followed and progressed. Although generally considered as only likely to live a few days, he is now engaged in arduous and important business. The needle was inserted easily without local anæsthesia, the passage of the wire taking about fifteen minutes. About 50 milliamperes were passed, and after slight temporary spasm, there was immediate relief from pain, and the patient slept horizontally without opiate and with less dyspnœa than formerly. Antisyphilitic treatment followed, and in a fortnight he returned home and has had no setback, improvement steadily progressing, and the dyspnœa disappearing. Experience suggests that the operation is harmless, objective symptoms are relieved immediately, and that antisyphilitic treatment increases the improvement and favours the prognosis.

ANÆSTHESIA FOR NOSE, THROAT AND ABDOMINAL SURGERY BY THE NITROUS OXIDE-OXYGEN C. E. COMBINATION*

H. Edmund G. Boyle, O.B.E., M.R.C.S., L.R.C.P.

Anæsthetist and Lecturer on Anæsthetics, St. Bartholomew's Hospital, London, England

Let me begin by thanking you most heartily for the great honour you have conferred on me by making me your Honorary Chairman to-day. An honour that I realise quite well is conferred on the Royal Society of Medicine of London, England, through me, their representative.

On behalf of my colleagues, the members of the Anæsthetic Section of the Royal Society of Medicine, I give you greeting. Be well assured that the other members of our Section, although unable to be with us in the flesh, are nevertheless with us in spirit; and are anxiously waiting for the time when they can read the interesting and illuminating papers with which this conference is pregnant.

The study of anæsthetics has undergone so great a change since I began to give anæsthetics some twenty years ago, that it would be a brave man who would foretell the "anæsthetic position" of 1941.

I am neither prophet nor seer, but I venture to think that we are but now entering on an era of anæsthesia fraught with endless possibilities, an era such as our predecessors never dreamed of, indeed I believe that had our predecessors practised the art as we know it to-day, they would probably have been burned at the stake as wizards or magicians.

The anæsthetist of to-day is a totally different individual from the anæsthetist of twenty years ago. Now he has to be thoroughly *au fait* with the thousand and one things that go to the making of a good anæsthetist; he must be thoroughly conversant with all the modern methods, and in short be of real use to the surgeon.

Gone, gone for ever, I trust, are the times when any Tom, Dick or Harry was allowed to give the anæsthetic, quite irrespective of whether he knew anything about it or not.

The time has come when some of the thinking surgeons have begun to realise the importance of a good anæsthetist and a good anæsthetic; and let us hope that the general public will soon begin to realise the importance of insisting on having a skilled anæsthetist whenever possible. I feel sure that I am but voicing your own sentiments when I say that we ought all of us to do our best to put the study of anæsthetics on to a proper basis. Every student of medicine should be compelled to learn this important branch of the profession, and the administration of anæsthetics should be confined to qualified practitioners of medicine. Thus and thus alone can we put anæsthesia on to its proper footing.

The great advances that have been made in recent years lead me to think that we are only now entering on a new era in anæsthesia. At the recent researches at St. Bartholomew's Hospital by Dr. Mackenzie Wallis, on the chemical, and by Dr. Hewer on the anæsthetic side, lead me to think that we have a prospect for the future that almost baffles our imagination.

Wallis and Hewer have produced an anæsthetic under the name of "ethanesal," which is a vast improvement on anything we have had before. Wallis has found that an absolutely pure ether will not produce anæsthesia, he has also found that the anæsthetising body of the ether is the ketone group or parts of it, and that the great impurity of most ethers was mercaptan.

After a great amount of experimental work Wallis and Hewer have come to the conclusion that a combination of absolutely pure ether with some of the ketones gives an exceedingly fine anæsthetic body, and this they call ethanesal.

I have used this compound myself, and have had it administered to me, and I have no hesitation in saying that I consider it far superior to any other form of ether that I have so far encountered. There is little taste or smell, and after the operation one awakes almost at once with the very faintest taste of ether, which lasts but 2 or 3 minutes.

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*Honorary Chairman's Address, Canadian Society of Anæsthetists, Niagara, June 3rd, 1921.

There is seldom any nausea or vomiting, and it is far less irritating to inhale than ordinary ether.

I have taken the opportunity to-day of acquainting you with what is perhaps the very latest work on the other side, in the hope that some of you may benefit by that knowledge, and probably help in working out the further development of this important advance in our knowledge of anæsthesia.

In the study of anæsthesia, there can be no better or surer way of improving our knowledge than by conferences such as this. Here are gathered together anæsthetists from every quarter of this great continent, all ready and willing to share their knowledge with their fellows for the benefit of mankind in general and anæsthetics in particular.

Now let me turn to administration of nitrous oxide-oxygen, chloroform, ether combination for nose, throat and abdominal surgery.

Let me begin by saying that I think the two great essentials for an anæsthetist to keep in his mind are:

(1) The safety and comfort of the patient; (2) The comfort and convenience of the operator.

If we take the first (and the most important) I think that in a great many cases the safety depends on the knowledge the anæsthetist has of some given method. By this I mean that it is safer for a man to use a method that he knows of, rather than to use another method, which in itself is safer, but of which he has no knowledge.

Now when we consider this question of safety and comfort of the patient we must include the pre-operative, operative and post-operative periods.

Take the pre-operative time: this includes the preparation before operation, etc.; then with a little care and forethought one can do much to help the patient. In my opinion there is no need for the drastic treatment that used to be meted out prior to operation: there is no need for that starvation and severe purgation that was in vogue years ago. The patient should be on a light diet and should be given an ordinary laxative. We must remember that any operation entails a certain amount of strain upon the patient; it calls for an effort on his part, so that he should not be enfeebled by starvation, purgation and by the giving of enemata. I have never heard it advocated that an athlete just prior to some big contest should be starved and purged—and indeed there is no sense in it.

Of course there are a certain number of cases when it is essential to have the bowel clear, and naturally one does not include these in the above statement.

Pre-operative medication has done a lot to rob operations of their terrors, and if the patient is given some morphine and atropine, or morphine, atropine and scopolamine hypodermically before the operation, they usually come to the table in a drowsy state with their mentality somewhat dulled, a great improvement on the custom of years ago; and this is apart entirely from the fact that they usually need less anæsthetics.

(N.B.—It is well to bear in mind that after hypodermic injections of morphine and atropine, and especially after morphine, atropine, scopolamine, the patient should not be allowed to walk to the theatre but should be carried).

During the last four years I have been endeavouring to find some anæsthetic or mixture of anæsthetics which could be used in combination with gas and oxygen, to produce a more complete relaxation when necessary, and in nose and throat work, to assist in the maintenance of anæsthesia.

I have tried a great many mixtures, and until the introduction of ethanesal a few weeks ago I was using as my adjuvant a mixture of chloroform and ether of equal parts. Now I have substituted ethanesal for ether, and find that the chloroform is only needed for nose and throat work, and for some of the abdominal cases.

The aim of all who have been working on this matter has been to induce a state of anæsthesia which was without danger, was pleasant for the patient, was adequate for the surgeon's needs, and was associated with the slightest toxæmia.

It must, I think, be fairly obvious that the after condition of a patient who has been operated on under gas and oxygen anæsthesia ought to be, in theory, and is, in practice, far better than when ether or chloroform has been given, for since the nitrous oxide and oxygen are non-toxic and are quickly eliminated, the patient returns to a normal state far more readily than after the more potent and toxic drugs.

We must remember that after an ether or chloroform administration it takes some time for the drug to be eliminated from the sytem, and this process of elimination must add to the strain on the patient.

The actual technique of the administration is quite simple and the necessary skill is readily acquired.

In 1917, when still in military surgery, I read a paper on nitrous oxide plus oxygen with regulated re-breathing. I had not then had much opportunity to use this anæsthetic in civilian practice, but since then I have been using it for a great variety of cases.

In 1917 I thought that nitrous oxide plus oxygen was not well suited to abdominal work; I have since been trying to form a combination of anæsthetics which would give me adequate relaxation and yet would require the administration of the minimum of toxic substances. At the moment I am using as my relaxant a mixture of chloroform and ethanesal of equal parts, so that the anæsthetic becomes a combination of nitrous oxide-oxygen-ethanesal-chloroform, and with this I have been producing a type of anæsthesia which entails but little strain on the patient and is wholly adequate for the surgeon's needs. The actual technique I now employ is:

The patient is given morphine, atropine and scopolamine half an hour before the operation.

Gas and oxygen is then given in the proportion of about 1 of oxygen to 10 of gas, and as soon as the breathing begins to get deep and regular the gases are allowed to pass over the surface of a mixture of chloroform and ethanesal (equal parts) so that they pick up a small amount of mixture. In a few minutes the breathing becomes automatic, with slight soft stertor, thus shewing that anæsthesia has been obtained. The tap on the mixture bottle is then turned back, so that the patient is only having gas and oxygen and the operation is begun. The amounts of gas and oxygen must now be regulated to what the administrator thinks will be the correct amount; and this for the majority of cases is about 1-4 (*i.e.*, one of oxygen to 4 of nitrous oxide.)

In many operations it is quite unnecessary to give any more mixture, and the remainder of the operation is conducted under gas and oxygen.

Given in this way the anæsthesia is excellent both for patient and operator, whilst the after condition is extremely satisfactory. The patients readily regain consciousness, and in the majority of cases are not inconvenienced by nausea or vomiting.

In addition to this is the fact that they are hardly, if ever, conscious of the fact that they have had anything save gas and oxygen, for they do not, as a rule, have any taste or smell of ethanesal or chloroform. This lack of smell and taste of ethanesal and chloroform carries another point worth bearing in mind. Those working in the theatre—surgeons, anæsthetist, nurses, etc.—do not become impregnated with the smell and odour of ether or chloroform—an important point for their own comfort.

Using this method, I find that after a long afternoon in a theatre I can leave feeling quite fresh and well, and that the atmosphere of the theatre never becomes charged and laden with the vapour of ether and chloroform.

The small amount of ethanesal or mixture that one needs with this method is sometimes astonishing to those who are unfamiliar with it, for it is quite the usual thing to use but a drachm to a drachm and a half during a long operation such as the removal of a breast.

Operations such as amputations of the breast, hernias, varicocœles, and the like, are quite easily done under gas and oxygen and a very small quantity of either ethanesal or mixture; it is when one comes to the abdominal or nose and throat work that the difficulty begins.

For some time now many of us have been trying to get some combination to act as a really good relaxant for abdominal work.

Gwathmey of New York uses a combination of ethyl chloride, ether and chloroform, whilst McKesson of Toledo recommends a saturation with nitrous oxide. Personally I have not tried this method up to the present, and I have preferred to rely on my mixture of equal parts of ether and chloroform, but I hope before returning to London to have an opportunity of seeing Dr. McKesson use this method. I have been using this mixture for the last two years, and have only substituted ethanesal for ether during the last three months, with, I think, a great improvement, not only in the anæsthesia but also in the after-effect, and I am only now beginning to realise what a good relaxation I can obtain, and how easily it is to produce it almost at will, and within a few minutes.

It is hardly necessary to add that in giving this combination for abdominal work, a certain amount of intelligent anticipation is necessary on the part of the anæsthetist, so that the surgeon may find the abdominal wall quite relaxed when the time for sewing up has arrived.

Let me make this a little clearer:

Assume that we are operating on a case of appendicitis. The anæsthesia is deepened at the beginning, so that the surgeon may easily find the appendix and bring it outside; but when once outside the anæsthesia need not be of a deep character, and so we only give gas and oxygen. Later on, when we see that in a few minutes the cæcum will be returned to the abdominal cavity and the peritoneum sewn up, we again deepen the anæsthesia by turning on the mixture for a few minutes, and directly the peritoneum is stitched up we can again return to gas and oxygen alone.

My experience of abdominal work done in the manner I have tried to explain is that the patient is infinitely better both during and after the operation when the combination of nitrous oxide-oxygen-ethanesal-chloroform is given, than after any other combination or single anæsthesia that I have so far encountered.

Now let me for a moment turn to the use of this combination in nose and throat work. When I first began to use this method for nose and throat work, I had nothing to guide me, so far as I knew my friend Gwathmey, of New York, was the only man who had tried to give gas and oxygen for throat work, and he had only begun, for the war cut short his work in New York and he came over to Europe.

I will not weary you with an account of my earlier cases. Many of them were failures, and it is only by sticking to it and having such a cordial co-worker in Mr. Harmer, our senior throat surgeon at St. Bartholomew's, that we have been able to evolve a technique which I believe to be an excellent one for this type of operation and one which is infinitely superior to anything that we have tried before.

Briefly, our technique is:

1.—*Pre-medication:*—

Children, none—or at most 1-200 gr. atropine.

Adolescents—morphine 1-6 gr., atropine 1-150 gr.

Adults—Either Burroughs & Wellcome Hyoscine Compound, "A" or "B" according to size.

Hyoscine Componnd "A" contains:

Hyoscine hydrobromate, gr. 1-100.
Morphine sulphate, gr. 1-6
Atropine sulphate, gr. 1-180.

and Hyoscine Compound "B" contains:

Hyoscine hydrobromate, gr. 1-100
Morphine sulphate, gr. 1-4
Atropine sulphate, gr. 1-150.

The injections are given half an hour before the time of operation.

The patient is then anæsthetised with gas and oxygen, and the anæsthesia deepened with ether or mixture until the breathing is deep, regular and slightly stertorous, the colour should always be *pink*. The face piece is then removed, a gag placed in the mouth for those cases in which it is necessary (*e.g.*, enucleation of tonsil), and the anæsthetic is continued by means of a tube placed in the mouth. Let me hasten to say that one of the astonishing things about this method is the small amount of mixture that is necessary to maintain the requisite anæsthesia. Indeed, in a certain proportion of cases hardly any mixture at all is necessary for the rest of the operation; that is to say, after the face piece has been removed. After that, as I have said, in a certain proportion of the cases gas and oxygen alone is sufficient.

In this connection I must mention that there is one particular type of case where I have been forced to use chloroform alone as my adjuvant. I refer to cases of diarthermy. In our throat department Mr. Harmer is treating cases of carcinoma of the tongue, fauces, etc. with the diathermy cautery, and I gather with excellent results. Now, occasionally in these cases there is a certain amount of sparking—either accidental or intentional; one cannot therefore have any ether in the adjuvant bottle lest there be an explosion, and must use chloroform. In a large number of these cases one finds that the best way to continue the anæsthesia is to pass one or two small rubber tubes through the nostrils and pass the anæsthesia into the post-nasal or endopharyngeal space; and this I do by means of a metal stirrup and tubes.

A still further development of this method has become necessary when dealing with certain plastic operations on the face, and with such conditions as laryngo-fissure.

The first occasion on which I used endotracheal gas and oxygen was on October 9, 1918, for a case of laryngo-fissure. In this case after the tracheotomy was performed, I gave gas and oxygen by means of a small catheter through the tracheotomy tube and with excellent result. Since then I have resorted to endotracheal gas and oxygen on many occasions.

In conclusion, let me say that the man who wants to give the nitrous oxide-oxygen-ethanesal-chloroform combination successfully and well must bear in mind that the patient's colour must always be pink, and that he must not give the mixture for longer than is absolutely necessary.

As his skill with the method increases, so will he diminish the amount of mixture that he gives, and by that amount will his patients benefit in their condition both during and after the operation.

Case Reports

CASE REPORTS FROM THE MONTREAL GENERAL HOSPITAL

W. H. Eakin

House Officer in Pathology

Case 1.—Hæmorrhage from a Solitary Tuberculous Ulcer of the Transverse Colon, associated with Tuberculosis of Lungs and complicated by Diabetes Mellitus.

M. G. H.—No. 4343—1921.—Male, 54 years of age, stableman, was admitted to the service of Dr. F. G. Finley, September 21-1921, complaining of cough, weakness, anorexia, thirst and polyuria.

In June the patient developed a "cold." About the same time nocturnal frequency of urination and an increasing thirst were noticed. In this period of about four months he lost 52 pounds in weight, he weakened progressively and the nocturnal frequency and polydypsia continued.

Previous to his present illness he had always been in good health. He denies venereal disease but admits drinking three to four quarts of beer a day.

Family History—Mother died of diabetes mellitus. No tuberculous infection in family known.

Condition on admission—Patient is thin, with evidence of recent loss of weight and dehydration of tissues (a dry inelastic skin). There is marked clubbing of the fingers. Axillary glands are palpable; superficial arteries somewhat thickened; heart normal; blood pressure, 140-90. Temperature 98; pulse 86, regular; respirations 32.

Respiratory system—Antero-posterior diameter of chest is increased, but right side somewhat flattened. The upper portion of the right side, front and back and upper axilla, are dull on percussion with diminished and altered breath sounds which in some portions are cavernous in character. The left chest is hyperresonant,, and the breath sounds vesicular. The patient has a slight cough with a small amount of purulent sputum. Urinalysis—Spec. grav. 1028; a trace of albumin, a few granular casts; sugar 2.5 %

Course of illness—While in hospital, a period of twenty-three days, patient was kept in bed, put on strict diabetic diet and became sugar free in four days. There was continuous fever of an irregular intermittent type; the cough was persistent with a small amount of sputum which after repeated examination revealed tubercle bacilli. Patient continued to lose both weight and strength. Six days after admission he complained of pain in the rectum and passed a small amount of red blood in the stool. Rectal examination failed to reveal the source of the bleeding. Three days later 10 oz. of blood were passed per rectum; on the following day one oz.; and again on the succeeding day a large quantity. At no time was there any abdominal tenderness or distension. Following upon the haemorrhages the patient rapidly became weaker and died October 14, one hundred and thirty-six days from the onset of illness.

As stated, he became sugar free four days after admission. He remained so for twelve days when excess of sugar again appeared in the blood. This reappearance of hyperglycaemia was accompanied by a slight fall in plasma carbonates which did not appear to be due to an acidosis but to loss of alkali resulting from the hæmorrhage.

Clinical Diagnosis—Pulmonary tuberculosis; pulmonary emphysema; tuberculous ulceration of the intestine, probably in the colon; diabetes mellitus; chronic nephritis.

Autopsy Report.—A 21-211.

Gastro-intestinal tract—With the exception of the sigmoid and rectum, which contained blood stained faeces, the intestines were collapsed. In the sigmoid the upper portion of the faecal material was not blood stained, and the demarcation between blood stained material and that free from blood was sharp. There was a solitary ulcer in the mid portion of the transverse colon. This ulcer, which lay transversely was 4 cm. in diameter and was situated opposite the mesenteric attachment. It was irregular in outline and the base was uneven due to numerous nodular elevations. It contained neither blood nor blood clot. The serous surface opposite the ulcer did not show any gross evidence of tuberculosis. There were no other ulcers in the gastro-intestinal tract. Right lung—In the apical region and throughout the upper lobe there were numerous tuberculous cavities, some of which were traversed by thickened bronchi and blood vessels. The largest of these cavities was in the apex.

Summary and Remarks—A male, 54 years of age, who had no history of previous illness was admitted with chronic pulmonary tuberculosis with cavitation, diabetes mellitus, chronic nephritis, and emphysema of the lungs. During his ilness, a period of four months, there was continuous and increasing loss of weight and strength. This was accompanied by a persistent, slight cough with purulent sputum in which tubercle bacilli were found. Polyuria and polydypsia were present. On a strict diabetic diet he promptly became sugar free and remained so until hæmorrhage from the intestine complicated his illness The faeces contained bright red blood. For this reason and because no other source of the intestinal hæmorrhage could be determined, a probable diagnosis of hæmorrhage from tuberculous ulceration of the large intestine was made. This was confirmed by autopsy. Hæmorrhage from tuberculous ulcer of the intestine is, in the experience of this hospital, uncommon.

TUBERCULOUS MENINGITIS SIMULATING ENCEPHALITIS LETHARGICA HAEMORRHAGICA.

Leonard C. Dursthoff

Senior House Physician, Service of

Dr. C. A. Peters

Case 2.—M. G. H.—No. 1998—1920,—Male, age 23, coloured, was admitted complaining of chilly sensations, headache, backache, abdominal discomfort, and soreness of the neck.

Previous History—He had had some febrile ilness at 4 years of age, pneumonia at 11 years, was gassed while with the army in France in 1917.

Present Illness—This began 10 days ago with headache, backache and abdominal discomfort. Since that time he has had one or two chills daily, folowed by profuse perspiration. There has been no epistaxis, cough nor expectoration. For the past six days he has been in bed.

Examination on admission—An extremely well developed and well nourished young man. Pupils equal and react to light and accommodation. There are no pathological reflexes. The tongue is coated and somewhat tremulous. Several small calcified glands are palpable in the right side of the neck. The heart is centrally located and normal. Temperature is 100, pulse 78, and regular with no dicrotism. Respirations are 28 to the minute. There are a few scattered fine crepitations over both lungs. There is no evidence of infection in the genito-urinary tract. The neck is slightly stiff. The blood count showed 7,000 white cells to the cmm. No malarial parasites were found. The urine was normal and the Wasserman reaction negative.

In view of the general clinical picture and the absence of malarial parasites a tentative diagnosis of typhoid fever was made and a blood culture was taken in ox bile. This remained sterile after several transplants. The Widal reaction was negative.

Course of Illness—From the time of admission until the time of his death, a period of ten days, he gradually became more and more drowsy and somnolent with irrational periods. Although he became unable to put his chin on his chest there was never any retraction of the head, nor spasm of the cervical muscles. He coughed four or five times daily but never had any expectoration. His temperature was remittent, ranging between 101° and 103° and his pulse gradually increased to the rate of 136 per minute. The white cells in the blood were never over 9,000 to the cmm. The ocular fundi, ear drums, and throat were normal. A second blood culture planted on various media was sterile. An X-ray examination of the chest showed a centrally located heart and a fine mottling throughout the upper third of each lung.

On account of the increasing lethargy and the persistence of the pain and stiffness of the neck, a lumbar puncture was done, when bloody fluid, not under pressure, was obtained. Smears from this fluid showed cellular elements of the blood in the same relative proportion as in the blood itself. A Wasserman of this fluid was negative. A second lumbar puncture was done on the following day when similar fluid was again obtained. On the day of death he was very lethargic, but could be aroused and would obey simple instructions. The pupils were equal and reacted to light and accommodation. There was at times a slight internal strabismus alternating with a lateral nystagmus. His neck was a little stiff and painful. At times both arms showed definite spasms and in the purposeless movements, his left arm and hand were not as active as his right. There were no pathological reflexes. The diagnosis of encephalitis lethargica haemorrhagica was made.

Post Mortem Findings.—There was a widespread and very diffuse miliary tuberculosis and an acute tuberculous meningitis. This was most marked beneath the meninges.

Over the base of the brain there was free blood and the cerebro-spinal fluid was blood stained. In the pia-arachnoid there was fresh blood.

Summary and Remarks.—A negro, 23 years of age was taken acutely ill with the signs and symptoms suggestive of typhoid fever. During his illness, a period of ten days, signs and symptoms referable to the central nervous system developed. From two lumbar punctures blood stained fluid was obtained. The post mortem examination showed miliary tuberculosis and tuberculosis meningitis. The reasosn for making the diagnosis of encephalitis lethargica hæmorrhagica were:—(1.) Increasing lethargy; (2.) Negative laboratory proof of an acute infection; (3.) Absence of pathological reflexes; (4.) Involvement of eye muscles. (5.) Two lumbar punctures from which blod stained spinal fluid was obtained. (6.) There recently occured, in this hospital, a case similar in many respects to the above and from which lumbar punctures yielded blood stained fluid. This case post-mortem showed an extensive intrapial and subdural hæmorrhage and the histological findings in the central nervous system corresponded to those found in Encephalitis Lethargica.

Retrospect

ON THE PARKINSONIAN SYNDROME

Colin. K. Russell, B.A., M.D.

Lecturer in Neurology, McGill University.

Neurologist, R.V.H.

A review of a paper by Dr. M. A. Souques read at the annual meeting of the Neurological Society of Paris, June 3, 1921, appears in the Revue Neurologique No. 6, 1921. The facts presented by Dr. Souques mark an important advance in our knowledge of this affection. Paralysis Agitans or Parkinson's disease is not a morbid entity. It is a syndrome due to different causes acting on the same region in the brain. The nature of the lesion appears to be of much less importance than its site. Since the first description of the disease by Parkinson and shortly afterwards by Charcot and Vulpian, much has been written on the clinical history of the disease, but its etiology and pathological anatomy is still obscure and uncertain. The lesion has been looked for in the muscles, in the nervous centres, and in the endrocrine glands. Recent investigators place it in the corpus striatum and locus niger. The epidemic of encephalitis just experienced has given rise to so many cases of this syndrome that it has drawn attention to the possible infectious origin of the disease.

Recent investigations of the physiology and anatomy of the corpus striatum have shown that it is apparently an autonomous organ, a complete centre with its afferent tract coming directly from the optic thalamus, and its efferent tract going to the optic thalamus and the hypothalamic region. The anatomical division of the corpus striatum into two parts is arbitrary and artificial; embryologically the division is into the globus pallidus on the one hand and the putamen and caudate nucleus on the other. These two parts differ in their structure, their functions and their pathology. To the former has been given the name paleo-striatum and to the latter that of neo-striatum. The two Vogts looked upon the corpus striatum as a sensori-motor centre with the functions of coordination and of inhibition. Through the-intermediary of the optic thalamus, it received either from the periphery, the cerebellum or the cerebral cortex stimuli which it elaborated and sent on to the hypo-thalamic centres, and thence by the extra pyramidal motor tract to the medulla and the cord. In the inferior animals the thalamus is the primitive centre for sensibility while the corpus striatum is the head centre for motility. When the cerebral cortex and the pyramidal tract appeared in the higher animals it lost its importance but still plays in man a considerable role as a motor centre. From anatomo-pathological investigations it is inferred that the organ is the centre of automatic movements and of muscular repose, and also one of the important centres of muscular tone. When it is destroyed, there is the abolition of automatic movements with muscular rigidity as a tetanic tremor. According to Ramsay Hunt the globus pallidus is a motor nucleus of the corpus striatum, and plays through the extra pyramidal motor system an identical role to that which the cortical motor centres play through the cortico spinal system; it exerts a control on the extra pyramidal motor neurones, that is to say, through its relations with the hypothalamic centres, it has a true control of the automatic and associated movements. It follows that the destruction of the large motor cells of the pallidal system produces paralysis agitans, that is to say, an increased tone, tremor and a paralysis of automatic movements. Just as the destruction of the small cells of the putamen, and the caudate nucleus determine a choreo-athetosis or the syndrome of Vogt. So, finally, the destruction of both types of cells produce Wilson's disease.

In a last analysis one can consider paralysis agitans as a disease of tone. The centres of tone can only exist in motor cells, tone being a permanent reflex of which sensory fibres constitute the centripetal paths, and motor fibres the centrifugal paths. There are centres of tone in the anterior horn of the cord, in the mesocephalic cells, in the central grey ganglia and in the cerebral cortex. The most important centres of tone in man are without doubt in the brain, as complete section of the cervical cord, either experimental or from pathological conditions, shows.

The disturbance of tone explains the essential symptoms of Parkinson's disease, namely, the muscular hypertonus on which depends the disturbance of posture of the body, the facial expression and the phonation. The frequency of sympathetic disturbances, flushes, perspirations, dribbling of saliva and œdemas means the existence of sympathetic centres in the region, wherever it is, which is the site of the anatomical lesion. Brouwer places these centres in the caudate nucleus. Tretiakoff states that the locus niger is a sympathetic regulating centre. In defending this hypothesis, he argues the analogy of structure that Marinesco has observed between the cells of the locus niger and those of the sympathetic ganglia. It is possible that sometimes the pain, which one observes not infrequently in the course of Parkinson's disease may be explained by the neighbourhood of the optic thalamus.

To sum up, paralysis agitans would appear to be a syndrome dependent upon lesions of varying nature, but always affecting the same places. In exceptional cases these lesions may be macroscopical (tumors, hæmorrhages or softening,) but more commonly the lesions are microscopic, either infectious, toxic or ischæmic. In either case, these lesions will involve the corpus striatum, the locus niger, or the hypothalmic region—the future will decide between these lesions—and will cause a destruction more or less marked of the centres of tone.

In a later number will appear a retrospect on the Causes, Symptoms, Clinical Forms, Diagnosis and Treatment of this Syndrome.

Editorial

THE LABORATORY WORKER AND THE PRACTITIONER

IN its attempt to correlate subjective symptoms with particular laboratory findings the article by Professor John Tait on "*Marrow Pains" in Malaria and in Certain Other Acute Fevers* printed in this issue of our *Journal*, recalls the recent controversy stirred by Sir James Mackenzie's strictures upon present-day methods of medical education. It will be remembered that the distinguished heart specialist, in view of his own particular experience, was led to advocate a different line of approach towards the study of disease from the prevailing laboratory route, on which so much stress is laid at present. In the view of Sir James Mackenzie the general practitioner, and not the academic teacher using laboratory methods, occupies the best vantage-point for assessing defects in our medical knowledge and particularly for studying the *symptoms* of disease. Naturally his statement was qualified, and he also said: "The peculiar nature of the science of medicine prevents anyone realising how its advance can be made unless he has himself prosecuted definite inquiries and discovered the nature of the lack of knowledge. At this day there are many problems calling for solution, and on account of lack of knowledge we do not even know how to proceed to their solution. Not only that, but I would further state that the profession has such a confused notion of medical research that it does not realise that there are problems to be solved." In view of Sir James Mackenzie's special insistence on the symptoms of disease as offering a fertile field for investigation by the practitioner, Professor Tait's paper is of interest, for it deals with subjective symptoms, which, in respect at least of their locality, are interpreted through findings of the laboratory. Without presuming to express an opinion as to the ultimate truth of the relation suggested by Professor Tait between marrow involvement and pain, we may nevertheless note that the inquiry took origin not in clinical but in laboratory experience. Spite of the high significance of bone marrow to the physiologist and pathologist and, in certain special cases, to the clinician himself, bedside workers have scarcely as yet been in the habit of attributing any of the subjective symptoms of their patients to affection of this tissue. If any conclusion is to be drawn, it is that we should not be too particular in laying down hard and fast rules as to modes of inquiry into medicine, and further that occasional excursions by laboratory workers into clinical fields are beneficial and stimulating.

ON THE RELATION BETWEEN MENTAL AND PHYSICAL EFFICIENCY

IN a recent Editorial in the British Medical Journal the writer discusses and emphasizes the importance of the results obtained in research work undertaken by Dr. Alfred Mumford to determine the relation between mental and physical efficiency in the pupils of the Manchester Grammar School. All physicians recognize the necessity of bodily exercise to maintain a proper condition of health. Especially is this true in individuals of sedentary habits, and in the developing school child. The ancient doctrine of temperaments taught that an abnormal activity of certain organs of the body such as the liver and the spleen conferred on the individual distinctive characteristics. It is many years since the doctrine has been discarded. Recent research, however, shows a definite correlation between certain physical attributes notably the respiratory function and general mental and physical fitness. Dr. Mumford in his work also noted the close relation between improvement in the respiratory powers, and the general health in a group of rachitic children under treatment. As their breathing powers became developed their attacks of night terror and fearfulness disappeared, and they willingly associated in games with their companions. He determined therefore to carry on his investigations further, and find out whether there was any intimate relation between the respiratory capacity and their attainments in school. The first calculations were carried out according to the method of Professor Dryer of Oxford by measuring the largest amount of air a person can inhale after deep inspiration "the vital capacity". The results obtained showed a very definite relation between this vital capacity and school attainments during the early ages of school life, a relation which became less marked at the later ages of 16 to 18 years. It was found that intensive study for examinations tended to reduce the respiratory capacity for the time being, but the reduction was fully recovered after a holiday. These experiments led Dr. Mumford to attempt the measurement of the movements by a direct method. The time was noted during which a boy could hold his breath against a column of mercury some 40 mm in height. It was a test of will as well as of physique In an average class in one of the middle forms he found that the five top boys of the class held the mercury for an average period of thirty-three seconds, while the five bottom boys could only hold it for an average of 19 seconds each. In a matriculation form the five best boys held the mercury for an average of 31 seconds each while the five bottom boys held it only for an average of 23 seconds. In order to test the influence of competition a number of boys were made to repeat the test before the whole class. He found that the best ones improved their record, while the worst ones failed to reach their previous standard. Dr. Mumford considered that those who had good respiratory powers had not only a higher mental capacity for studies, but had also stronger wills, and powers in reserve which they could use in an emergency, while those with poor respiratory powers either could not or would not exert themselves further. This research is distinctively suggestive and should attract the attention of all physicians interested in the developing child and its education. The apparatus used by Dr. Mumford was an adaptation of the sphygometer with the substitution of a jacket for an armlet.

ON THE VALUE OF VARIOUS KINDS OF SOAPS AS ANTISEPTICS IN HAND WASHING.

MANY varieties of soaps are advertised as of value not only in cleansing the skin, but as having a definite antiseptic action. The actual value of such antiseptic action has been carefully tested by Dr. Norton of the Department of Hygiene and Bacteriology of the University of Chicago, and from a paper published in the Annual Report of the investigation of the Therapeutic Research

Committee of the American Medical Association we note the following facts.

The manufacturers of these soaps base their claims for antiseptic action on the phenol co-efficient of the antiseptic reagents used. Hamilton and also Syme working separately some years ago have shown that very few of the so-called antiseptics, with perhaps the exception of the mercuric iodid possess any antiseptic properties when mixed in soaps. In the examination which was a practical one, twelve different samples of soaps were used varying from the cheapest toilet type to the most expensive so-called germicidal or antiseptic soap. Hands were washed with each article in sterile water at 40°c., and then rinsed. Following this repeated washings and rinsings were carried out. From the various wash waters and rinsings plate cultures were made, and the number of bacteria estimated. Cultures were also made from the soap solutions after standing for periods of time up to five hours. The amount of soap used in each case was estimated by titrating with standard acid solutions, and was regulated to a strength of 0.5 per. cent.

The figures obtained by these various tests have proven that more bacteria are removed by washing with ordinary toilet soaps than when the more expensive soaps are employed. Moreover that the number of bacteria in the wash waters in every case remained practically the same. It was also noted that the rinsings even after repeated washings still contained large numbers of bacteria. Dr. Norton draws the following conclusions:

1. Ordinary toilet soaps remove the largest number of bacteria from the skin.
2. Absolutely sterile hands cannot be obtained by even repeated washings.
3. Soap solutions as produced in hand washing are not antiseptic.
4. The so-called antiseptic and germicidal soaps do not possess the qualities claimed for them.

SMALLER HOSPITALS AND THEIR CLINICAL POSSIBILITIES

THE life of country physicians is a laborious one and a matter of more serious moment, they are without the facilities for study and investigation. To correct these conditions steps should be taken to improve the great and increasing number of small hospitals throughout the country, so as to make them centres for clinical and investigation work for those within reach of them. Such a plan under efficient direction could be made much more useful than brief post-graduate courses that relatively few are able to undertake. To make these hospitals effective for such work they must be properly equipped with chemical laboratory and microscopical outfit installed in suitable, well-lighted, comfortable rooms. This would be all that would be required in quite small hospitals. Those in larger centres should in addition have an efficient x-ray equipment with the requisite accommodation and conveniences. These should be in charge of a fairly well-trained physician who should also have supervision of the laboratory. Except in the large communities only part of his time would be so occupied. A small separate building to house both laboratories would be desirable. In most of such places there would be a Health Department in which case the accommodation would meet the needs of both Hospital and Health Department.

It would be reasonable to ask the local governments to provide these buildings and equip all the laboratories. In some of the Provinces they aid in the building of local sanitoria for the care of tuberculous patients to the extent of 20 per cent of the cost, a very laudable policy; it would be as laudable to aid in increasing the efficiency of the smaller hospitals so as to make them more effective for the local public and at the same time, give more effective service to all classes, rich and poor alike, a matter quite as important as the care of the tuberculous, important as that is.

If this scheme were devedoped as above suggested no doubt much benefit would result. The real good aimed at is to secure cooperation by the physicians themselves and bring within their reach facilities for training in better methods so as to enable them to cope with the newer problems constantly evolving through the advance in both clinical and laboratory activity so keenly pursued in all centres of teaching and investigation. The result of such plans will be in direct ratio to the value of the work done by each individual for, after all, the greatest benefit to anyone is obtained from the work he himself does. Further such organized work would develop systematic effort, more study and clearer thinking. The frequent meetings to be held would also, and this is important, train in giving incisive expression to well-fortified opinions, a faculty in great need of improvement in the Canadian profession. As in all other aims that are worth while, such results can be attained only "by the sweat of the brow."

In such good work there is no doubt of the sympathy and assistance of the larger centres especially the teaching faculties. For some months, the Ontario Medical Association has been sending one or two men to read papers or give addresses at local societies making request for them. That this effort has been appreciated is shown by the numerous requests that have been received.

It is to be hoped that there will be an expression of opinion on the part of the profession in the country in regard to this matter.

A. McP.

Men and Books

The Evolution of Modern Medicine:* by Sir William Osler, Bart.

The appearance of this book is to be regarded as a very noteworthy literary and educational event, which will undoubtedlydo much to diffuse a knowledge of the History of Medicine among the rank and file of the profession, and to popularize the ideals which are emphasized through all its pages. In the Author's words, he has taken us with him on "an aeroplane flight through the centuries, touching only the tall peaks from which may be had a panoramic view of the epochs through which we pass." The wealth of illustrations, many of them from unusual sources and not previously published, were all selected by his own personal care with a view to the elucidation of the text, and add greatly to the value of the outline sketched for us by a master hand.

To those of us who remember the delivery, by Sir William Osler, in April 1913, of the Silliman Lectures on the History of Medicine, their recent publication by the Yale Press under the above title comes as the fulfilment of a long cherished hope. Turned over to the printers with his usual promptitude, the manuscript was immediately set up in type, but he himself held back the partly corrected galley-proofs until his death, awaiting in vain the return of that leisure of mind and heart which had been so rudely interrupted, first by the duties imposed by the great war, and then by the sad preoccupation induced by the loss of his only son; for their appearance now we are greatly indebted to the editorship of his friends and disciples, Fielding H. Garrison, Harvey Cushing, Edward C. Streeter and Leonard H. Mackall. In the Preface, Dr. Garrison, his most sympathetic interpreter, writes:

> "These lectures are in effect a sweeping panoramic survey of the whole vast field, covering wide areas at a rapid pace, yet with an extraordinary variety of detail. The slow, painful character of the evolution of medicine from the fearsome, superstitious mental complex of primitive man to the ideal of a clear-eyed rationalism is traced with faith and a serene sense of continuity.
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> "This work, composed originally for a lay audience and for popular consumption, will be to the aspiring medical student and the hard-working practitioner a lift into the blue, an inspiring vista or 'Pisgah sight' of the evolution of medicine, a realization

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*The Evolution of Modern Medicine. A series of lectures delivered at Yale University on the Silliman Foundation in April, 1913, by Sir William Osler, Bart., M.D., F.R.S., New Haven, Yale University Press, 1921, 213 pp., 107 illustrations.

of what devotion, perseverance, valour and ability on the part of physicians have contributed to this progress, and the creditable part which our profession has played in the general development of science.

"The editors have no hesitation in presenting these lectures to the profession and to the reading public as one of the most characteristic productions of the best-balanced, best-equipped, most sagacious and most lovable of all modern physicians."

To those familiar with the facts of Osler's early biography, who know something therefore of the sources at which his genius fed, these lectures have still another significance, revealing to an extent no other communication from his pen had yet done, the depths of his own inner life. The cultural influences of his early environment, his own enthusiasm for the great traditions of the past, and the note of personal consecration to an ideal of work and service that undoubtedly dominated his consciousness, all lent to his character that mental balance that may be termed *religious*, in the best sense of the word. It seems, therefore, a part of the poetic sequence of events that so often illuminates the pages of history, that the occasion of his last visit to this continent should have supplied the opportunity for the consummation of the spiritual avocations of his life, through the delivery of these Lectures under the Silliman Memorial; for this Foundation has as its specified object the illustration by means of such annual courses, of "the prescience and providence, the wisdom and goodness of God, as manifested in the natural and moral world, by the orderly presentation of the facts of nature or of history!" And here we have, written clear, in unwavering characters, Osler's *Credo*, the paean of his invincible optimism, his belief in the inherent greatness of man and in the power of those elements of reason, moral law and freedom that stretch within us, as Kant puts it, "in fields of illimitable grandeur," and his sense, also, of the relative values of the "uncharted spheres," which, though understood by us but dimly, yet "erect altars of righteousness within our hearts." "It is a glorious chapter in history," he concludes, "in which those who have eyes to see may read the fulfilment of the promise of Eden, that one day man should not only possess the earth, but have dominion over it."

How close his subject lay to his heart, is to be traced in the quotations from Shelley, his favourite among the poets, with which his book begins and ends. And then, with his own engaging *con moto* of style (to use Garrison's apt expression) he delineates to us, in clear continuity, the different strains of medicine, and paints, in bold succession, those various stages by which human reason has come to-day into its own. Through the "dark backward and abysm of time," and from the origin of medicine "out of the primal sympathy of man for man," we ascend to that first mountain-top of ancient Egypt, where, in the dawn of history, "after milleniums of upward progress, traced in the records of the stone age, civilization first sprang forth, Minerva-like, complete, from the ocean of oblivion." We next emerge upon "the glory that was Greece and the grandeur that was Rome"—Asklepios, Hippocrates, Alexandria and Galen. We are shown in succession the pale glimmer of Arabian and Byzantine Medicine, and the brighter gleams of the South Italian School and the rising French Universities, illuminating the black darkness of mediaeval medicine, steeped in Galenic rule; then the great sunburst of the Sixteenth Century due to the studies in anatomy, and physiology of Vesalius and Harvey, and to the inductive methods of Descartes. Following these advances we note the origin of modern clinical methods through the birth of pathological anatomy in the observations of Morgagni and his school; the revival of the Hippocratic method by Sydenham and the early French clinicians, Laennec, Bichât and the rest; the discoveries that revolutionized the middle nineteenth century by Lister and Pasteur; the victory of preventive medicine on this Continent in the control of yellow fever and malaria by the self-sacrificing investigations of Reed, Carroll and Lazear; and last, but not least, the splendid triumph of modern sanitation under General Gorgas in the hygienic reclamation of Panama!

Here, silent as on a peak in Darien, we stand at last and look in mental vision across the tossing waters and blue hills to distant Greece, and see there, as in a pageant, those far other days—"when were born," says Osler, quoting Lucretius, "out of the night, the blinding night"—"*O Graiae gentis decus*"—the company of men whose thoughts made our thoughts, and whose ways made our ways,—the men who first dared to look on nature with the clear eyes of the mind."

Profoundly moved by the tale of human achievement and by the glory of man's spiritual advance, tenderly and with reverence of heart, do we receive these sprays of laurel that are garnered for us here, from the stately garlands of the past, by the hand of one whose own name is now numbered with the great ones of all Time.

MAUDE E. ABBOTT

Abstracts from Current Literature

SURGERY

Reconstruction of the Common Bile-Duct. WALTON, A. J.: Brit. Jour. Surg., October, 1921.

THE author reviews the causes of destruction or permanent obstruction of a portion of the common duct.

1.—Accidental injury of common duct during operation of cholecystectomy—much less common than was at one time believed, probably less than 1.5%. Less frequent since the adoption of the technique of beginning the removal of gall bladder from the cystic duct end, rather than from the fundus. Only positively ensured against by exposure of all three ducts, hepatic, cystic and common, before the application of clamp or ligature. The danger of clamping the common duct in picking up a divided, retracted and spurting cystic artery must not be overlooked. If the injury be recognized immediately, satisfactory repair can usually be attained but if overlooked a biliary fistula results and by the time secondary opeation is attempted the lower end of the duct is reduced to a fibrous cord.

2.—Injury of the common and hepatic ducts owing to congenital absence of the cystic duct. The author reports a case (illustrated) in which the hepatic ducts entered the proximal side of the neck of gall bladder, the common duct emerging from the distal side.

3.—Early chronic pancreatitis—Operation for colic reveals no stones, no dilatation of gall bladder or ducts but the head of pancreas is hard and nodular and a probe fails to enter duodenum.

4.—Advanced chronic pancreatitis with obstructive jaundice. Operation reveals a distended gall bladder and ducts filled with "white bile"—so-called. Here it is safest to immediately form an anastomosis between duodenum and supra duodenal portion of common duct.

5.—Carcinoma of gall-bladder and ducts.

6.—Carcinoma of head of pancreas.

7.—Obstruction of common duct from scar tissue either within or without its lumen.

Operations undertaken to overcome the foregoing conditions are:—

1.—Direct suture—Suitable only when the injury to the duct is recognized early or in cases of excision of a stricture. The author condemns the use of the T tube.

2.—Lateral choledochenterostomy—also condemned.

3.—Re-formation of an absent common duct.

The author reviews historically the procedures adopted and discusses the limitations and difficulties of each. He then describes the technique of an operation he has devised and used with satisfaction in six cases (reports appended).

Briefly, the steps of the operation require exposure of the upper patent end of the bile duct with introduction and suture of a tube; the cutting and turning downward of a flap from the anterior surface of the duodenum; suture of the upper portion of the gap in the duodenum with introduction of the tube into the portion left open; turning upward of the duodenal flap to cover in the tube.

A. T. BAZIN

Transfusion Reactions and Citration Within the Needle. FRANK W HARTMAN.: Jour Ameri. Med. Assoc., January, 1922.

THE author discusses reactions that occur in transfusion by the citrate method. Those occurring during administration are signs and symptoms of acute cardiac dilatation, cough, praecordial distress, rapid heart action, etc. Besides these, which are readily controlled, by slowing up the transfusion, the ordinary signs of transfusion of an incompatible blood are so well known that they only require mentioning. They are headache, vomiting, pain in the back, cyanosis, ecchymosis and clonic spasms. These always come on during the transfusion of the first 75 c.c. He discusses in detail the reactions which occur after the administration which always come on within the first three hours. These embrace symptoms of fever, from 100 to 105 , beginning one to three hours after transfusion, and lasting sometimes one to three days, chills or chilliness, nausea, vomiting, urticaria and malaise. It is considered that most of such symptoms are due to incipient coagulation changes in the transfused blood, possibly due to blood containing thromboplastin and thrombin, due to abrasion or disintegration of the platelets, and setting free of the thromboplastic elements. Consequently in all methods of transfusion by the citration method the less the blood comes in contact with substances such as glassware, rubber tubing etc., the better. The shorter the time the blood is outside the vessels and the less alteration in its temperature the less will be reactions due to the above. The less stirring the blood has and the less aeration the fewer reactions there will be.

He describes and illustrates a compact apparatus of bottles in which a negative or positive pressure is readily induced by a two-way syringe. By the needle, which has a double nozzle, he is able to introduce citrate at the base of the needle, so that the blood receives its citration immediately it leaves the donor's vein. In 1918 when he used this apparatus his reactions, in 60 cases, were 38.3%. Of these cases 46 were done for pernicious anaemia, with reactions in 20 cases, or 43%. With a newer apparatus in 40 cases he claims his reactions were only 20%; and in pernicious anaemia he had 3 reactions in 15 cases, or 20%. He claims a reduction of reactions of 50% in his series. The article suggests the principle used in the Robertson citration bottle apparatus, though the factor of introducing citrate proximal to all the rubber tubing is new. A large series of cases of transfusion by the citrate method is mentioned in which the reactions vary from 15% to 65%. The author's percentage of 20% in his last 40 cases is considerably below the average noted in the literature of most operators.

CHAS. K. P. HENRY

Pernicious Anaemia With Special Reference to the Spleen and the Large Intestine. MAYO, Wm. J.: Ann. of Surg., September, 1921.

PERNICIOUS anaemia is a disease in which there is progressive degeneration of the red blood cells with permanent changes in the production of these, associated with spinal cord changes of a degenerative nature, achlorhydria and glossitis. The etiology is unknown, the early symptoms are often indefinite, and when the disease is diagnosed it is not curable. It is demonstrated that the actual perversion of the red cell formation lies in the bone marrow but the cause of this is quite unknown. The function of the spleen in cases of pernicious anaemia has been extensively investigated in the Mayo Clinic. Prior to November 1st, 1917, 50 splenectomies were done for pernicious anaemia. It was noted in following up these cases that many showed a marked gain in weight, there was improvement in the percentage of haemoglobin, on an average of from 36% to 72% and with a red cell count increased on an average from about 2,000,000 to more than 4,000, 000. Subsequent to the above date the operation was discontinued for 3½ years when a follow up of the above cases showed that 21% survived 3 years or more, thus living 2½ times as long as the average in a similar group of cases of pernicious anaemia at the same stage of the disease who had not been operated on. In addition 10 (6-10%) were alive after 5 years. A synopsis of this series showed that the average life of pernicious anaemia cases after splenectomy was prolonged in 33% of cases, and that there was hope of cure in about 10% of cases. It was noted that after splenectomy the course of the disease was ameliorated, that the relapses were less severe, and that the cord changes were less rapid. It is well known that the spleen breaks up deteriorated or weakened red cells. In pernicious anaemia the cells appear to be born feeble, and the spleen destroys them faster than it does normal red cells. This has been shown by Winifred Ashby who showed that the destruction of transfused red cells in pernicious anaemia was not so rapid as the cells of the individual in many cases. The pathology of the spleens removed was indefinite, disappointing and of no value in forming an opinion as to the cause of the disease. In the first 19 cases there were 3 deaths and none in the last 40 cases. All splenectomies should be preceded by one or more transfusions of blood, and it is useless to do a splenectomy in the terminal stages of the disease. The relation of the large intestine to pernicious anaemia is discussed and it is noted that the frequency of cancer and tuberculosis in the first part of the bowel is greater than in other portions of it. In these portions they produce, without accompanying haemorrhage, very quickly an anaemia much more severe than cancer or tuberculosis in other portions of the body with the one exception of cancer of the fundus of the stomach. The frequency with which it has been noted that the above exists suggests the importance of intestinal toxins in the production of pernicious anaemia. There is no proof, however, that there is any such toxin absorption which produces anaemia. It has been noted that the intestinal parasite Balantidium coli occurs as a flagellate parasite which is quite common in the pig. Quite a number of cases have been noted of the presence of this parasite in man where it is situated in the intestinal wall, later in blood vessels and organs and in many cases encysted. In the intestinal wall it produces ulcerations. In the human there has been associated with its presence an intense anaemia with the associated cord changes and in some cases a haemolytic agent has been present. In chronic cases eosinophilia has not been noted. The author does not claim that this is a cause of pernicious anaemia but draws an analogy between the anaemia produced by it and that seen in other pernicious anaemia cases. Even when present it may not be found in the stools if it has penetrated the intestinal wall. Apparently it produces death in all cases. Pernicious anaemia itself destroys over 6,000 lives yearly in the United States. Synopsis: In pernicious anaemia very immature bone marrow red cells are thrown into the blood stream where the spleen breaks them up rapidly. The vicious circle is often successfully interrupted by removing the spleen with an increased life period for the red cells. There is no proof advanced as regards the intestinal or any other etiological factor of pernicious anaemia. Blood transfusions as frequently as required and splenectomy is the treatment offering the best results.

Chas. K. P. Henry

Pre-Operative Preparation of Patients with Obstructive Jaundice. Walters Waltman: Surg., Gynæc. and Obstet., December, 1921, vol. 33, page 651.

In order to determine the cause of the very free bleeding of jaundiced patients following operation, the writer investigated the records of the Mayo Clinic during 1918, 1919 and 1920. He found that out of 29 patients with obstructive jaundice at the time of operation the cause of death in 50 per cent. was intra-abdominal hæmorrhage. Death occurred in from 1 to 7 days after operation, probably due to continued oozing from traumatized surfaces. It was found in most cases that post-operative hæmorrhage occurred when the coagulation time of the venous blood was longer than 9 minutes. To determine the coagulation time Lee and White's method was used. One cubic centimeter of blood is withdrawn from a vein by means of a syringe and placed in a test tube, both having previously been washed with normal salt solution.

The coagulation time may be shortened by the intravenous injection of 5 cubic centimeters of a 10 per cent. solution of calcium chloride in redistilled water, after three injections on successive days. The calcium is also believed to combine with the bile pigments in the blood rendering them less toxic. Calcium by mouth has no such effect, and takes at least three days before any result is noticed in the coagulation time. Intravenous injection gives immediate results. To supplement the intravenous injection of calcium, 100 grains of calcium lactate was administered by mouth daily for 5 days. The patient was kept on a carbohydrate diet and given 4000 ccm. of water by mouth to facilitate elimination. The amount of glucose was also increased by using the Murphy drip proctoclysis of 15 per cent. glucose solution in tap water, one hour on and one hour off.

The maximum benefit from this regime is reached in four days. If the patient does not respond, blood transfusion is indicated 24 to 48 hours before operation.

George A. Fleet

Caries of the Hip-Joint. Bradford, E. H.: Surg. Gyn. Obstet., December, 1921.

In this interesting paper Dr. Bradford proceeds to prove, from cases under treatment at the Massachusetts Hospital School, the inferiority of plaster spicas to the traction abduction splint, in the treatment of hip disease.

Cure is to be obtained in this distressing affection by checking the crowding together of the diseased surfaces in acetabulum and femoral head. Plaster spicas do not accomplish this, nor do they in many cases afford sufficient immobilization. Dr. Bradford further states that to be content with a short spica in the treatment of hip caries is to be satisfied with inadequacy. The splint itself, which is meant to be used in the acute stage with crutches, should not be applied until extreme flexion or abduction deformity is corrected. By its use the leg is kept in the abducted position under traction, while in the convalescent stage it serves as a perineal crutch. Its continued use is indicated so long as muscular spasm is present, while traction can be gradually diminished as the spasm subsides. Dr. Bradford's claim, substantiated by end-results obtained, is that by the early and thorough use of the splint, caries of the hip-joint can be definitely cured with practical restoration of function. J. A. Nutter

Some Observations upon the Treatment of Hip-Joint Disease. Fish, John E.: Surg., Gyn., and Obstet., January, 1922.

The writer refers to the numerous cases of hip-joint tuberculosis sent to his institution from all over Massachusetts and to the very varied methods of treatment found in use prior to their entry. Lack of uniformity in treatment is described as woeful, and attention is especially drawn to the apparent failure of the plaster-of-Paris spica as a routine method of treatment. This failure is notably shown as regards the prevention of deformity at the hip, many cases showing marked deformity who had been treated by this means for months and even years.

Dr. E. H. Bradford's abduction splint was tried in several such cases, with results much improved.

One case of undoubted hip-joint tuberculosis is reported. The patient a boy of twelve years, obtained, after four years of treatment largely by the use of the Bradford abduction splint, apparent recovery without shortening and with good motion in all directions. Practically without exception cases treated in this way from the first have made good recoveries with motion, which has not been found to be true in the much larger number of cases treated by the plaster spica. J. A. Nutter

Reconstruction of the Shoulder. Wheeler, W. I.: Brit. Jour. of Surg., October, 1921, vol. 9, page 247.

This case report concerns a pensioner of 25, the upper end of whose humerus (the head and several inches of shaft) had been blown off by a high explosive shell. The arm hung helplessly by a pedicle containing vessels and nerves.

A long graft was taken from the patient's tibia and driven into the freshened upper end of the shaft of the humerus after the scar tissue had been removed. The upper and free end of the graft, about five inches in length, was placed in contact with the freshened genoid and acromion and coracoid processes. The extensive wound was covered by a muscle and skin flap from the chest. The arm was held in an abducted position by a splint, and the graft became fixed above and below. A very useful arm was the result. Much hypertrophy of the graft at the points where it needed most strength is strikingly shown in the x-rays. The author appends a list of fourteen points about bone grafts which may be read with interest and profit. J. A. Nutter

Reconstruction of Ankylosed Knee-Joints. Wheeler, W. I.: Brit. Jour. of Surg., October, 1921, vol. 9, page 242.

The author reports a case of bony ankylosis of both knees in a child of 11 years. following acute osteomyelitis of both tibia. Murphy's method of pedunculated fibro-fatty flaps was used, while the x-rays taken after operation show that practically the whole of the upper tibial and lower femoral epiphysis were removed.

The case was most unexpectedly painless in its after-treatment, this being due in the author's opinion to the complete removal of any remains of the lateral ligaments and joint capsules which carry the sensory nerves. It is interesting to note that Putti advises against arthroplasty in children on the score of their inability to suffer what he considers to be the inevitable pain of the after treatment.

With regard to lateral instability ot the knee joint, so great a bugbear in connection with this operation, the author points out (1) that the femur was grooved from before backwards to admit a corresponding elevation on the summit of the tibia and (2) that if no lateral movement is allowed during repair there will be a condensation of the connective tissues on each side, which will form new lateral ligaments. Results were excellent J. A. Nutter

UROLOGY

Clinical Studies on the Use of Mercurochrome. Young, Hugh,H., et al: Jour. of Urology, vol. 5, No. 4, April, 1921.

This is a report in experiences with Mercurochrome, over a period of two years from the introduction of the drug, in which it is claimed that the early expectations of its great value have been realized. The disadvantages of the drug are in its occasional irritating action and the staining of clothing, etc., which results. The introduction of the water-soluble sodium salt is responsible for the diminution in the amount of irritation. The excess of alkali proved to be responsible for much of the irritation. The stains are easily removed from the skin by the use of acid, alcohol, vinegar, permanganate and oxalic acid solution. The stains on clothing are more resistant.

Reports of its use clinically may be briefly summarized according to the conditions in which it has been used:

First—Acute Urethritis.—Solutions of 1 per cent. are usually well borne in the urethra, but occasionally they may prove irritating and a weaker solution must be used. Solutions of ¼ per cent. to ½ per cent. are probably most satisfactory in producing the necessary germicidal effect and are always non-irritating. Solutions should be freshly prepared and occasionally substitution of weaker antiseptics should be employed.

Second—Chronic Urethritis.—The most satisfactory results of mercurochrome in the urethra have been in chronic urethritis, where the drug is used as an instillation and combined with the necessary instrumentation. Where the chronic posterior urethritis has been associated with chronic prostato-vesiculitis it has had good results. The dye has been recovered from the prostatic secretion by massage, more than a week after its injection. Young's method is as follows: The urethra is irrigated and the bladder filled with sterile water, normal salt or weak permanganate solution; the prostate and vesicles are massaged. The bladder is then emptied by voiding and the instillation of the mercurochrome solution made to the deep urethra.

Third—Cystitis.—Remarkable results are stated to have been obtained in many cases of long-standing cystitis. Where there is infection of the kidneys or of the prostate, naturally good results have not occurred. The drug has been found of great value in infection due to B. coli, following instillations of 1 per cent. solution. Cleansing of the bladder with sterile water or normal salt solution preliminary to the injection of the mercurochrome is essential, and injections are repeated according to the tolerance of the patient. It is best to begin with a ½ per cent. solution.

Fourth—Pyelitis.—The authors found that mercurochrome is as good a germicide in the renal pelvis as 1 per cent. silver nitrate solution, with the advantage that painful reactions do not follow the use of mercurochrome. The drug is of less value in coccus infections of the kidney pelvis.

Fifth—Venereal ulcerations, chancroids, buboes. Dressings with mercurochrome solution or paste have had splendid results.

Sixth—Chronic discharging sinuses.—Mercurochrome has been found valuable in discharging sinuses, especially those following the removal of tuberculous kidneys or epididymes. A 1 per cent. solution may be injected gently into a fistula, without harm, daily.

The article contains abstracts of clinical results obtained by other observers, and of some special cases treated by mercurochrome, given in detail.

F. S. Patch

UROLOGY

Contracted Bladder. Frontz, W. A.: Am. Jour. of Urol., vol. 5, No. 6, page 491.

The author points out that the majority of infections of the bladder are secondary to an obstruction to the outflow of urine from the bladder or to some extravesical disease. The condition he describes in this paper is one exception to the rule and apparently occurs without any known cause. The condition was first brought into prominence by Hunner under the term "Elusive Ulcer."

Under symptomatology the author emphasizes certain symptoms such as marked frequency of micturition extending over a long period and accompanied by pain in the suprapubic region when the bladder becomes full. He also points out that the symptoms are out of all proportion to the signs, in fact very frequently the urine may be quite normal. The examination of the bladder reveals simply a contracted bladder with puckering of the mucous membrane in one or more areas. If, however, the bladder is over-distended, a crater will be seen to form in one of these areas accompanied by bleeding.

Under pathology he shows that the lesions are submucous and consist in an infiltration of the submucous tissues, and later of all the coats of the bladder, by small round cells and fibrous tissue.

Under treatment he states that in the early stages benefit is derived from repeated distension of the bladder but that after the condition has advanced, excision of the infitrated area is the best means of obtaining a cure. In those cases in which it is impossible to excise the ulcer he recommends deep cauterisation of the cratered area.

WM. HUTCHINSON

Diagnosis and Treatment in Pathologic Conditions of Urinary Tract in Children. STEVENS, WILLIAM E.: Jour. of Am. Med. Assoc., vol. 77, October 1st, 1921.

THE paper is presented to emphasize the value of modern urological methods in the diagnosis and treatment of pathological conditions of the urinary tract in children. Cystoscopes are now available of a calibre of 16 to 18 French, by means of which cystoscopy and single ureteral catheterization of female children, as young as seven months, is possible.

The cases examined and treated by the author have ages varying from 12 months to 14 years and comprise tuberculosis of the kidney, diagnosed and operated; hydronephrosis and pyelonephritis.

The author draws particular attention to the possibilities of treatment of pyelitis by pelvic lavage.

F. S. PATCH

ANÆSTHESIA

COMPARATIVE STUDIES ON RESPIRATION

A Preliminary Stage in the Progress of Ether Anaesthesia. SMITH, EDITH PHILLIP, from the Laboratory of Plant Physiology, Harvard University. The Jour. of General. Physi. November 20th, 1921.

IT is pointed out that to study the effects of anaesthetics on respiration, it is desirable to use plants in order to eliminate the complication of muscular action and its influence on the rate of respiration. This study is done under conditions where the anaesthetic was the only variable. Wheat seedlings were used, aseptic precautions observed. Solutions of ether in distilled water, 1 percent, 3.65 percent, and 7.3 percent were used. In all, the first effect of ether is a depression of CO_2 production that is, rate of respiration. This is followed by a rapid rise above the normal which is in turn followed by a fall. Here it is pointed out that a preliminary depression has not been previously noticed except by Irwin, in his results on frog's eggs and fundulus embryos. With the three other percentages the respiration is ultimately reduced to approximately the same level. The greater the concentration, the less time is required to produce the result. Even when respiration has been reduced below normal, recovery is possible upon removal of the ether and in time, appears to be complete. If, however, the rate is too far depressed, no recovery is possible. The importance of the initial depression must be reckoned with in any attempt at a general theory of anaesthesia. Attention is drawn to some questions arising out of the interpretation of these results, for example; at what points are stimulation, anaesthesia, and toxic irreversible changes established? These must be left for future experiments to decide

WESLEY BOURNE.

MEDICINE

An Analysis of One Hundred and Eighty-two Cases of Cancer of the Stomach. with special reference to the incidence of pre-existing ulcer. From the Medical Clinic of the University of Pennsylvania. TAYLOR, S. P., AND MILLER, T.: Amer. Jour. Med. Sci., December, 1921,

THIS study was undertaken with the idea of making available the data on gastric cancer, which has been accumulated in the clinic during the last ten years, and also to determine what evidence there was of any pre-existing ulcer.

The cases were divided into two groups: (1) those giving a history suggestive of pre-existing ulcer, and (2) those giving a history of a progressive downward course without previous gastric symptoms. In group (1) all cases were included with any previous gastric symptoms, whether typical or not of ulcer, and yet they amounted in all to only 31, or to 17 per cent. of the series.

Pathologists do not agree on the percentage of cases of carcinoma which develop secondarily to ulcer, and a number are quoted whose views vary from 71 to 5 per cent. Clinically there is a similar diversity of opinion. Smithies, Moynihan, Deaver, C. H. Mayo and others being quoted as believing that a history strongly suggestive of ulcer, could be obtained in a large percentage of carcinoma cases Friedenwald on the other hand, who carefully analysed a thousand cases of carcinoma, found a suggestive history in only 7.3 per cent., Also the facts that carcinoma of the duodenum is rare, whereas ulcer is common, and that in proved ulcer cases malignancy rarely develops, makes these writers think that perhaps the small percentage is correct.

Over eighty-five per cent. occurred between the ages of 40 and 69, and there were three times as many males as females, and all were white but two, who were negroes.

Pain was the chief complaint in 55 per cent,, and was one of the principal complaints in 88.5 per cent., and in 94.4 per cent. of these it was in the epigastrium. When pain was referred from its original site to some other place, in 50 per cent. of the cases it was to the back. Relief of pain as a result of various circumstances was due in 60 per cent. to vomiting, and less often to eating, belching, bowel evacuations, applications of heat, etc.

Constipation, impairment of appetite, vomiting and nausea occurred in a large percentage of cases, whereas hæmatemesis was mentioned in only three cases. The average loss of weight was 30 pounds.

In the ulcer-before-cancer group, the average duration of symptoms was 10.5 years, and in these the duration of what might be called symptoms due to malignancy was 4.5 months. In the whole series, the average period of cancer symptoms was 8.6 months. These figures agree with other observations.

The age incidence in the ulcer-before-cancer cases shows almost thirty per cent. of the cases began in the fifth decade, and about twenty-five per cent. in both the fourth and sixth decades. When this was compared with the age incidence in a series of benign ulcer cases, it was found to be much later, showing that either ulcer developing late in life is more apt to become malignant, or that the early symptoms were really not due to ulceration but to slowly developing malignancy. Previous history and occupation seemed to have no bearing on the condition, there was a history of other cases of cancer in the family in 8.8 per cent.

A mass was palpable in 61 per cent. emaciation noted in 82.9 per cent., tenderness in 55.5 per cent., and abdominal rigidity in 43 per cent.; visible peristalsis was noted in only 30 cases, but this the writer thinks may not be a correct figure, as this sign has often to be carefully and repeatedly looked for, and as the series included many cases of retention, he thinks it might have been found more often if searched for. Enlargement of the left supra-clavicular lymph glands occurred in 7 cases, and in no case on the right side.

Most cases showed a moderate secondary anæmia, the lowest count being 20 per cent. Hbg. and two million red cells. There was a moderate leucocytosis in 31.2 per cent., there being a leucopenia, or normal white count in the majority of cases. The stools were tested for blood in only 97 cases, and only 53.6 per cent. of these gave a positive reaction. This small percentage of positive reactions may be due to the fact that great care was taken to have the patient on meat free diet for several days before the test was made.

Gastric analysis was done in 155 cases; 53.6 per cent. showed retention, 68.4 per cent. showed no free H.Cl, and 12.9 a low H.Cl content. Where there was pyloric involvement, or involvement of the lesser curvature, probably producing some stenosis, the acid figures were higher. Of 83 Wassermann tests done, only one was positive. Blood pressure was estimated in 119 cases, and the average systolic pressure was 118.

There were x-ray reports on 125 cases. Carcinoma was diagnosed in 121, in 3 the findings were said to suggest carcinoma, but that the evidence was inconclusive, and one only was wrongly diagnosed as adhesions and later proved by operation to be carcinoma.

Of the cases operated upon, removal of the growth was attempted in only 28 per cent.; in one half of the remainder no surgical interference of any kind could be attempted, showing that judging by this series, of the patients coming to operation for gastric cancer about one-third are given a chance of cure, one-third are treated palliatively, and for one-third nothing can be done.

The analysis of this series is interesting, showing as it does the small percentage of cases with a history suggestive of ulcer, and also that in spite of the small percentage of what we generally consider signs of advanced disease, such as palpable abdominal mass and visible peristalsis, yet at operation 30 per cent. were beyond even palliative measures.

That we should not rely on any one test, is shown by the fact that the positive reaction for occult blood was present in only 53 per cent. of cases, though in the gastric analyses the characteristic findings of low or absent free H.Cl was pretty constant. That the x-ray reports gave correct diagnoses in more than 96 per cent. and was wrong in only one instance, shows what can be done in well-trained hands by this means. R. H. M. HARDISTY

Therapy in Neurosyphilis, with Particular Reference to Intraspinal Therapy. SCHALLER AND MEHRTENS: Arch. of Neurol and Psychiat., January, 1922.

THIS report consists of 208 cases of neurosyphilis treated by intraspinal medication. Seventy-five patients were given thorough treatment, receiving from 16 to 18 intraspinal injections. Altogether, 1500 intraspinal injections were given. All the cases were treated by the intravenous and intramuscular method before receiving intraspinal medication

The conclusions of the authors are very favourable to the intraspinal method of treatment. The intravenous and intramuscular therapy is more efficacious in the meningeal, vasculomeningeal and diffuse types. The most useful field for intraspinal therapy is that of the meningo-parenchymatous types, including tabes. Patients with optic-atrophy and neurosyphilis without cerebro-spinal fluid reaction receive no advantage from intraspinal medication. Paretic patients should be given a trial, but the results are not very satisfactory. G. S. MUNDIE

The Intraspinous Treatment of Neuro-Syphilis. SICARD AND PARAF.: Rev. Neural., 27 : 1033, October, 1920.

THE authors cite their experience in the treatment and subsequent observation of a series of 14 cases, treated by the intraspinous route only, and have noted practically no improvement except where this method of treatment was supplemented by intravenous and intramuscular injections.

The cases treated were for the most part tabes and general paresis. They believe that the chief value of the method lies in the increased meningeal permeability set up by the intraspinous injection, and suggest, as a safer and more efficient substitute, the injection of sterile saline. This must always be carried out in association with intensive antisyphilitic treatment by the venous and muscular routes.

They report two sudden deaths following the subdural injections. In their hands, the intraspinous administration of arsphenamized serum did not produce the results reported by Marinesco, Swift and Ellis, and others.

F. H. MACKAY

Arteriosclerosis. EVANS, G.: Practitioner, January, 1922.

THE author discusses the nature of artetiosclerosis, which he considers to be an arthritis. His observations lead to the conclusion that the bacterial toxins, as the best known causes of infection, are the provocative factors. Old age induces arteriosclerosis only in so far as it allows time for chronic bacterial infection to have its way, while, at the same time, the resistence of the arterial walls to infection, with diminishing tissue vitality, is gradually overcome.

The prevention of arteriosclerosis is attained by clearing up the chronic infections in the body. The author insists that arteriosclerosis and Bright's disease are so closely associated as to lead one to the conclusion that some at least of the causes of Bright's disease are concerned in the production of arterial disease.

C. F. MARTIN

The Blood Sugar Tolerance Test as an Aid to Diagnosis in Gastro-Intestinal Cancer. FRIEDENWALD, J. AND GROVE, G. H. Am. Jour. Med. Sc., January, 1922.

THE authors continue their observations on the diagnostic value of the blood sugar tolerance test in malignant diseases of the alimentary tract. They have already drawn attention to the fact that the sugar curve in alimentary carcinoma differs from that of cancers elsewhere in the body. The fasting sugar is high, and is followed by an initial rise up to 23 per cent., or higher, within 45 minutes after the ingestion of the dextrose, and remains at this level for at least two hours. The positive and negative values of the test are duly considered. C. F. MARTIN

Value of Vagus Stimulation in Paroxysmal Auricular Tachycardia. BROWN, D. C.: Heart, vol. 8, No. 4, August 1921.

THE writer outlines the cardinal clinical features of paroxysmal tachycardia (i. e the auricular form, not the ventricular) as follows:—

(A).—Tachycardia, rate usually under 225 per min.

(B).—The onset of the rapid pulse is abrupt.

(C).—The condition is not permanent, the termination of the attack being almost as sudden as the beginning.

(D).—The symptoms complained of are 'tightness' in the chest, shortness of breath, and cardiac palpitation.

He reports in detail one case in a male aged 38 years, showing the cardinal features above enumerated, but quite remarkable in that: the attacks could be cut short by almost any form of vagus stimulation, which is not often the case. Pressure on the vagi in the cervical region, pressure on the eye balls, and breath holding were all effective. The patient acquired the art of aborting attacks by making digital compression of the vagi himself. The extreme severity of the attacks in this particular case, the paroxysmal rate attaining 250 per minute, and there being as much as 2.5 cms. displacement of the left border, and alteration of blood pressures (Systolic of 84 mm. and diastolic of 76 mm. on one occasion) made the manoeuvre a life saving one. C. C. Birchard

Quinidine in Auricular Fibrillation. Eyster and Fahr: Arch. Int. Med., vol. 29, No. 1, January 16th, 1922.

This is a report of the results of the use of quinidine sulphate in the treatment of this cardiac disorder with the object of restoring normal rhythm.

Case 1.—Female, aged 47 under treatment in hospital for considerable time for auricular fibrillation with marked heart failure—orthopnoea, anasarca, hydro-thorax. At time of beginning quinidine medication she had improved very much, and was comfortable. First day of treatment—Dosage of 0.75 gms. (12 grs.). Heart became rapid with alternating periods of regularity and irregularity; dyspnoea and cyanosis developed. Symptoms ameliorated after cessation of the drug. Second day—With the same dosage the results were similar to those of the preceding day. Third day—Dosage and results were as on the other two days.

Case 2.—This was a young university student who had had auricular fibrillation for thirty-one months dating from an attack of influenza. Dosage was similar to that employed in Case 1. On the first day the pulse became regular for short periods, and the rate rapid. The patient complained of palpitation. On the second day periods of regularity were more pronounced. On the third day the pulse became regular and remained so, the rate at the same time falling to 66 per minute, and palpitation disappearing.

In the case of the female, quinidine caused re-appearance of all the signs of heart failure, and to such an extent that treatment had to be discontinued. In this case the quinidine was harmful. In the case of the young student, the return of regular rhythm was prompt and with a minimum of objectionable symptoms.

Reports in the literature indicate that quinidine is successful in about 50% of cases, and that, as in Case 1, its use may be harmful. C. C. Birchard

Further Observations on Treatment of Scarlet Fever with Immune Human Serum. Weaver, G. H.: J. A. M. A., October 29th, 1921, vol. 77, page 1420.

The author has observed definite improvement in acute scarlet fever cases, following the intra-muscular injection of serum derived from 200 to 300 cc. of blood from an otherwise healthy convalescent scarlet fever patient during the fourth or fifth week of his disease. The serum is allowed to separate and 0.3 percent of tricresol added. The serum from 4 or 5 convalescents is mixed and kept on ice. Of this, 90 cc. are injected into the gluteal muscles No advantage has been noted in giving the serum intravenously. A. H. MacCordick

Relation of Hodgkin's Disease to Sarcoma With a Report of Two Cases. Mueller, T.: Jour. Med. Research, June-September, 1921.

From 1914 to 1921, 16 cases of Hodgkin's disease were studied at the New York State Institute for Malignant Disease. In 14 of these the diagnosis was confirmed by microscopic sections. There were 10 males aged from 9 to 43 years, and 16 females from 13 to 48 years of age. In all the cervical and axillary nodes were involved and in 11 the mediastinal glands. In one case there were invasions of the lung, aorta wall and spinal cord by the lymphogranulomatous tissue. The study only tends to illustrate further the difficulty in determining the cause of the disease and its relation to sarcoma. The question again arises; Is Hodgkin's a true neaplastic disease, or is it an infectious process? The author is of the opinion that round celled sarcoma of the lymph glands and lympho granuloma are one and the same thing. A. H. MacCordick

DERMATOLOGY

Ichthyol in the Treatment of Erysipelas. Eisler Leska Dermatologie, vol. 1, No. 6, 1920.

Pure ichthyol was used exclusively in a series of ninety-six consecutive cases of erysipelas in the following manner: The drug is spread over the affected area and a short distance beyond the margin. The entire surface thus covered is dotted with small particles of absorbent cotton. In hardening the ichthyol incorporates the cotton and makes a protective dressing, which adheres well to the skin surface. No bandaging is necessary and one application is sufficient. In most cases there is no tendency to peripheral extension. In practically every case of the series the temperature dropped, the distressing symptoms disappeared and the erysipelas cleared up in from four to six days.

To the capillary tonic and antibacterial action of ichthyol are attributed the favourable results.

Philip Burnett

The Treatment of Antenatal and Congenital Syphilis. Fordyce, J. A., and Rosen, I.: Arch. Derm. and Syph., January, 1922.

Comment is laid on the importance of a routine Wassermann examination in every maternity case. The conclusion is reached that early and proper treatment of a syphilitic mother-to-be will allow of a healthy child being born. The importance of beginning early is dwelt on.

Treatment pursued by the authors is of 6-8 injections of arsphenamin, at weekly intervals, with mercuric salicylate or chloride, 1 grain, once a week for twelve to fifteen injections. Where tolerated the treatment is continued interruptedly during the entire pregnancy.

For the congenital syphilis they use the intravenous injection of neo-arsphenamin, and mercury, claiming good results in a series of 88 cases. H. E. MacDermott

Further Studies in Ringworm of the Hands and Feet. Mitchell, J. H.: Arch. Derm. and Syph., January, 1922.

The writer finds an increase in the number of cases of this disease, and thinks that the increase is both real and apparent. The real increase he thinks was due to spread of infection by demobilized soldiers, their camps having a considerable amount of eczema marginatum.

However, he has been more on the lookout in late years.

The disease may be transmitted from husband to wife, where there is the typical affection between the toes, or by walking on gymnasium floors, or in corridors with bare feet, or by towels even after being laundried. He emphasizes the need for microscopical examinations, saying that the diagnosis is otherwise unjustifiable.

Whitfield's ointment, salicylic and benzoic acids is highly commended, curetting of area beforehand being advised. In obstinate cases resort was had to 10 percent chrysarobin ointment.

For routine examination he thinks the K.O.H. and heat method is still the best. As regards cultivation, his experience is that it is easier to find the organism in the skin than to cultivate it in vitro. H. E. MacDermott

PEDIATRICS

An Eruptive Fever of Unusual Characteristics in Infancy and Early Childhood. Levy, J. David: J. A. M. A., December 3rd, 1921.

In April 1919 Levy presented before the Wayne County Medical Society (Detroit) a preliminary report covering some twenty cases of an eruptive fever of unusual characteristics occurring in infancy and early childhood. Briefly, it is a disease of late infancy and earliest childhood, characterized by a period of high fever, followed by complete defervescence by crisis, and, during the early hours of the post febrile period, the appearance of a macular eruption. A most striking feature of the disease is the sudden occurrence of a high fever in a previously apparently healthy baby. The fever when first noted is generally from 103 to 104 F. and tends to remain between these temperatures and 105 and 106, with no intermission and with very moderate remissions for a period of from seventy-two to ninety-six hours. With the high temperature, as a rule, there are virtually no subjective symptoms worthy of note. On the beginning or the end of the fourth day, there occurs a complete defervescence by crisis. During the succeeding few hours, the eruption appears—first, on the trunk, most frequently in the lumbar and adjacent thoracic regions and often extending rapidly over the rest of the body, with particular preference for the back of the neck and the scalp. The face is only slightly affected and the lesions are relatively few on the arms and legs. The lesions are often round, more frequently irregular macules of from 1 to 3. in diameter, and are pale rose red, at times chiefly when scanty, being more distinctly pinkish. They are not elevated. They are always discrete, save for the very occasional grouping of a few macules. The eruption is now itching. It reaches its height in a few hours, fades rapidly and is generally entirely gone within forty-eight hours. There is no desquamation. The diagnosis has to be made between scarlet fever, measles, german measles and the fourth disease.

In conclusion Levy says—"Unless the foregoing can be demonstrated to be an ordinary exanthem existing in a typical form due to a variation of the local strain of the virus, we are here dealing with an entity actually constituting a new disease. Until proof to this effect can be demonstrated beyond peradventure, however, it would be well to consider it an anomalous form of rubella, which of all previously described diseases it most closely approaches." H. P. Wright

News Items

ONTARIO

The February Meetings at the Academy of Medicine, Toronto;—Section of Obstetrics and Gynæcology, February 2nd; stated meeting, demonstrations in physiology in the Medical Building, Toronto University, February 7th; Section of Opthalmology and Otolarngology, February 13th; Section of Medicine, February 14th; Section of Surgery, February 21st; Special Meet- of the Radiological Association to be addressed by Professor Baetjer of Johns Hopkins Hospital, 8.30 p.m., February 23rd; The Ontario Radiological Society is holding a meeting on the same date, February 23rd, at 2:30 p.m.; The Section of Pathology, on February 28th.

It is hoped that arrangements will be completed for the dedication of the new Osler Hall and for the reception of the copy of the Sargent portrait of Sir Wm. Osler which is to be given by Sir Edmund Osler to the Academy that the ceremony of dedication and reception can be carried out on April 4th, 1922. The evening is to be given over to an Osler Program in which details of Sir William's life will be discussed by those who had the good fortune to be in personal touch with him at various times in their professional career.

The Lambton County Medical Society met on Wednesday, February 8th, in the Sarnia Chamber of Commerce. A paper was read by Dr. R. S. McComb of Toronto, on "Cystitis," and an address on "Heart Disease in General Practice," was given by Dr. Norman B. Gwyn of Toronto. After the papers, the election of officers for the next year took place. There was a good attendance and a free discussion.

QUEBEC

The 9th meeting of the Montreal Medico-Chirurgical Society, on the evening of February 3rd was addressed by Dr. J. Whitridge Williams, of Johns Hopkins Hospital, Baltimore, who took as his subject "Certain Obstetrical Aspects of Syphilis." This paper was based upon the examination of 4000 cases, which had been observed in his Service between April 1916 and December 1919. The conclusions arrived at were as follows:—

(1) The Wassermann reaction is at times unreliable, for in some cases while a negative reaction was obtained in the mother, the child was undoubtedly syphilitic. And again, in other cases, while the mother showed a positive reaction, the child was undoubtedly free from the disease. Far more reliable results are to be obtained from the examination of the placenta. If the placenta showed the characteristic changes of syphilis, the so-called Frankel's Disease, in from 85 to 90 p.c. of these cases, the child was syphilitic. The placenta

thus affords very reliable evidence of foetal syphilis. Williams's figures shows that it presents a reliability almost double that of the Wassermann. (2) The pregnant woman responds quickly and completely to antisyphilitic treatment. The increased volume of the mother's blood, and its hydraemic quality, may account for this. (3) Syphilis, in the new-born child may be recognised by an x-ray examination of its long bones. The changes to be observed occur at the junction of the epiphysis with the diaphysis, where, instead of the narrow, slightly curved line, 1 mm. in thickness, —Guerin's line—there is to be observed in the x-ray picture a dark, irregular, somewhat folded zone, 2 or 3 mm. in thickness. This change is due to an osteochondritis, and is clearly seen in the x-ray picture. The lower end of the femur, and of the tibia, and the upper end of the humerus, are the sites where the disease is most manifest.

In the Obstetrical Service at Johns Hopkins' Hospital, syphilis is found four times more frequently in the colored patients than in the whites. Dr. Williams closed his interesting Paper with the warning that syphilis was often overlooked. He warmly advocated a routine examination of the placenta for evidence of this disease; both with the naked-eye and with the microscope; and, if possible, the routine employment of the Wassermann.

MONTREAL OPTHALMOLOGICAL SOCIETY

The first regular meeting for the season 1921-22 was held at the Medical Society's rooms, 112 Mansfield St., on Tuesday evening, November 15th at 8.30 o'clock. The following living cases were presented for inspection by the members:—

Amaurotic family idiocy and a case of blastomycosis, by S. H. McKee; Retinitis Proliferans, by G. H. Mathewson; Cataract in a boy of 19, by A. B. Moore; Central degeneration of the retina, by J. Rosenbaum.

The following case reports were read and the specimens shown:—Metastatic Carcinoma of Choroid, by J. Macmillan; Removal of piece of Glass from an eye 7 Years after Accident, by F. T. Tooke; Cross and Microscopic Glioma of Retina, by S. H. McKee; (1) Tuberculosis of the Iris, by S. H. McKee; (2) Gonococcus Slide (special stain), by S. H. McKee; (3) Two slides of Morax (diplo-bacilli), by S. H. McKee.

BRITISH COLUMBIA

A clinical meeting of the Vancouver Association was held on January the twenty-third at Shaughnessy Military Hospital. A number of cases of disease of the nervous system were shown as well as others illustrating the results of gunshot wounds of the chest and empyema. This society held a special meeting on February the fourth for the purpose of discussing a recent enactment of the City Council of Vancouver, by which the medical men of the city are required to pay a tax of twenty-five dollars per annum. Drs. W. D. Brydone Jack and O. Weld were appointed a special committee to interview the Council and enter a protest on the plea, that, as medical men generally do so much free work, they should be exempted from taxation of this order.

Dr. C. H. Vrooman addressed the health bureau of the Board of Trade of Vancouver on January 18th, his subject being tuberculosis. He stated that one hundred more beds were immediately necessary. The total beds available in the Province were 260, and the total deaths in British Columbia last year were 446. The minimum accommodation needed for dealing effectively with the disease was one bed for each death. He also suggested that the next step necessary in British Columbia was the appointment of a travelling medical officer, who would act as a consultant and would have a certain amount of authority in getting patients into hospital.

Dr. J. S. MacPherson, C.M.G., who has been practicing in the Shawinigan and Cobble Hill district of Vancouver Island, has been appointed medical health officer of the municipality of Lomond, Alberta.

Dr. J. Kerr Wilson, resident of Vancouver for the past thirty years, died at the Vancouver General Hospital on January 21 after an illness of ten days. He was born near Bell's Corners in the Ottawa Valley and was 68 years old. Dr. Wilson was one of the first doctors to practice in Vancouver but retired from practice some years ago to take up ranching in the Fraser Valley. He had no children and is survived by his wife.

Dr. Gilbert Hartin, one of the best known physicians of British Columbia, died in Nelson, B. C. on February 4th of cancer. He was a native of Stittsville, Ontario; graduated at McGill in medicine; commenced the practice of his profession at Kaslo, B. C. in 1896, and in 1907 moved to Nelson. He is survived by his wife and two sons, H. T. Hartin of Winnipeg, and Dr. D. H. Hartin, of Nelson.

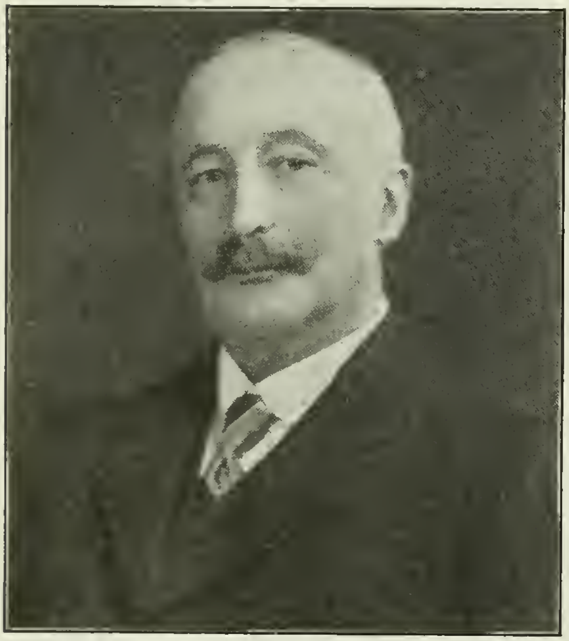
THE WINNIPEG MEETING

The annual meeting of the Canadian Medical Association will be held in Winnipeg June 20th to 23rd inclusive, 1922. The present time is none too early to be thinking about your hotel reservations. The Committee on Hotels and Information are very anxious that medical men intending to come to Winnipeg should write early regarding hotel accommodation. The Chairman, Dr. Gordon S. Fahrni, 507 Boyd Building, Winnipeg, will be glad to receive inquiries.

Obituary

DR. ALLEN MacKENZIE BAINES

The death of Dr. A. M. Baines on January 12th, 1922, at his home in Toronto, brought genuine sorrow to many hearts both in and out of the profession and severed another link with the standards and outlook of fifty years ago. His jovial and whole hearted attitude towards life was combined with a tenacious conservatism towards all that was sound and good in the social and professional customs of Canadian and British life as he became acquainted with it in his plastic days. Born into a large and well known Toronto family on May 12, 1853, he was educated first at the school in Cobourg, Ontario, conducted by Mr. Barron, father of the present Judge Barron of Stratford; and later, he was in Upper Canada College, 1867-70, from his fourteenth to his seventeenth year. Here, doubtless, he laid the foundation of his sound training in various sports and games, of which cricket claimed his best allegiance. He was Captain of the U. C. C. Eleven, and, after leaving College for a brief business career with the firm of Moffatt Murray and Beatty, we find him at nineteen, one of the eleven chosen to play the English Eleven visiting Canada in 1872. under Fitzgerald, which included the famous Dr. W. G. Grace, surely a distinction for the youthful cricketer. He appears in the well known engraving by Rolph, Smith & Co. showing the teams on the historic old cricket ground on the South side of College Street, between McCaul and Beverley Streets. One of the tales told of that match is that when his score was standing at 21, the redoubtable W. G. with Allen Baines bowling, was given his life by a dropped catch and went on to 144 ''not out.'' Bowling, fielding and batting all came alike to Baines' hand in those days. Fishing was a later pastime as was lawn-bowling and music.



He seems, during his brief period of commercial life to have fallen under the spell of the well known Dr. E. M. Hodder, of Trinity Medical College, where he entered in 1874, and we find him graduating from both Trinity University and from the old Toronto School of Medicine. In 1879, he took his L. R. C. P. London, where he remained for nearly four years doing much of his work in St. Thomas' Hospital. On taking up practice in Toronto in 1882, a serious illness necessitated a long sea voyage, and he went out to India, but not for long; and for almost forty years he made the community his debtor as a ''Doctor of the old school'' in hospital and private practice. His appointments as a teacher and examiner in medicine were many and various. His hospital career identified him mainly with the Hospital for Sick Children, where he served for thirty years, from 1891 to 1922. He served as physician in chief from 1913, and at his death, was a consultant physician, being retired from the active staff in 1919.

He will be remembered, too, by many for his work in the old Toronto General Hospital, both in the wards, and perhaps better still, in the outdoor department. He transferred from the active to the consulting staff of the T. G. H. in 1907-8 to devote his time fully to his duties in the hospital for Sick Children. His academic connection was first with Trinity Medical College where he lectured first on medical jurisprudence, and where he taught diseases of children and clinical medicine from 1891, becoming associate professor of clinical medicine and Professor of Pædiatrics in 1895, and upon the amalgamation of the two schools in 1903, transferring to the University of Toronto with the same rank and appointment.

He had long been specially interested in diseases of children, having been physician to the Infants' Home from 1882. He was on the staff of the hospital for incurables from the same date.

He was married in 1890 to Rose Jeanette Alice Troughton, a Devonshire lady, whose death six years before his own was a bitter grief to him. Their only child died in infancy.

He was a fine representative of a type of practitioner unfortunately not nowadays often produced, who avoided narrow specialism, maintained kindly humane relationships with master and man alike, and lived out the motto, ''Nihil humanum a me alienum puto.''

J. T. F.

DR. JOHN M. ELDER

There has passed from our midst a most notable member of the medical profession, J. M. Elder, C.M.G., B.A., M.D. After taking his B. A., he entered as a student the Faculty of Medicine of McGill in 1881, and after a distinguished career as a student and athlete. he graduated in 1885. He commenced practice in his native county of Huntington, but in a few years left the country and began work in Montreal, and was in a short time appointed assistant demonstrator of anatomy. In 1894 he succeeded Dr. Birkett as senior demonstrator, and in 1896 he was chosen to be a lecturer in anatomy, and also in medical and surgical anatomy. In the same year he received the appointment to a demonstratorship in surgery, after his election as an assistant surgeon to the Montreal General Hospital. He was made assistant professor of Surgery in 1897, and in 1898 became a full surgeon to the Montreal General Hospital, succeeding Dr. Kirkpatrick whose early death was much lamented. Thus Dr. Elder in the comparatively short space of eight years rose from an assistant demonstratorship of anatomy to be a lecturer in anatomy, and the assistant professor of surgery, and became an attending surgeon to the General Hospital. This fact college and in the hospital, and was an administrator of no mean talent. He was always a favorite with the alone speaks strongly for his ability, energy and work. Dr. Elder was a most excellent teacher both in the students entering with zest not only into their studies, but into their games for he was a good football player, and interested himself greatly in the athletic sports of the students. He was a man who held strongly his own opinions and was not backward in expressing them, always taking a strong stand for what he thought right.

He was much esteemed by his colleagues, and beloved by his patients. As a surgeon he was an acute diagnostician, and a careful operator, his long training in anatomy giving him great confidence. He kept well abreast of the times, and made many contributions to the literature of surgery. By the public at large, he was highly esteemed, and he left a very large practice behind when he went overseas with the McGill General Hospital as surgeon. No man will be more missed by his confreres than Jack Elder. He had much individuality, and every one who met him felt his personality. I, the writer, speak as one who has known him as a student, an assistant, and a colleague. F. J. S.

Colonel Elder's military career was equally as conspicuous as was his professional career. In 1885, just after graduation, he received the appointment of Surgeon-Captain to the Montreal Garrison Artillery, and went with this unit to the North-West, in which he served with distinction during the Riel Rebellion. On his return he maintained his interest in medical military affairs by continuing as medical officer to the Garrison Artillery, and was in a few years promoted to the rank of Surgeon-Lieut. Colonel, going on to the Reserve of Officers in 1900.

When the Great War broke out and the formation of No. 3. Canadian General Hospital (McGill) was under consideration, Colonel Elder was the first to volunteer his services, and when the organization of this unit was begun he was appointed Officer in charge of the Surgical Division. The selection of officers for that Division was largely his own, and the wisdom shown in its organization was proved later by the excellent work done. In his service overseas during a period of more than two and a half years, Colonel Elder's exceptional surgical skill and valuable organizing powers brought him a mention in despatches by Field Marshall Sir Douglas Haig in 1917 and a further recognition of his services by being made a Companion of the Order of St. Michael and St. George.

In the actual surgical work of the McGill Hospital Colonel Elder took a most active part, and during a battle period, when the work was heavy he was known to be occupied in the operating room from early morning until late at night. It was during one of the heavy periods of work on the 11th of May, 1916, while operating upon a suppurating gunshot wound of the thigh, that he received a streptococcal infection of the right forefinger which was followed by a serious illness and a protracted convalescence. On the retirement owing to illness, of the Commanding Officer of the Hospital in November, 1917, Colonel Elder was appointed his successor and continued as such until February 1918 when he received the appointment of Consultant to the British Army with Headquarters at Rouen; his organizing ability and experience as a consultant at this time proved of great value. Dr. Elder returned to Canada in January, 1919.

Colonel Elder by his genial and sympathetic disposition endeared himself to all the officers, nursing sisters, and men of the McGill Hospital, and was much beloved by the wounded soldiers owing to his untiring attention and kindness to them. His untimely removal from amongst us is deeply mourned by all those whose privilege it was to work with him in the Great War.

H. S. B.

DR. GEORGE C. C. FIELD

Dr. George Corelli Collard Field died in Winnipeg on Sunday, January 29th, after a short illness. A graduate of Trinity Medical College in 1894, he was one of the House Surgeons of the Hospital for Sick Children in Toronto. After pursuing studies in Edinburgh, Glasgow, London and Baltimore, he settled in Winnipeg where he has been practicing and teaching in Diseases of Children. He was lecturer on the staff of the Manitoba Medical College and head of the children's department of the Winnipeg General Hospital. He was buried at his old home in Cobourg on February 2nd.

DR. A. J. HENWOOD

Dr. A. J. Henwood died in Brantford on January 19th. Few men have had a more interesting medical inheritance, grandfather, father and two uncles were all graduates in medicine and practitioners. His father was one of the earliest house officers in the old Toronto General Hospital, going later to Brantford where he became an active member of the County of Brant Medical Association. Dr. Henwood's mother was a daughter of the late Dr. Alfred Digby of Brantford, another of the great medical pioneers of the province. Dr. Henwood's early education was at Dr. Tassie's famous Academy at Galt, then at Upper Canada College, and he took his degree of M.D.C.M. at McGill, in 1879. He was one of Brantford's best known physicians, and was for long at the head of an extensive and active practice.

DR. DONALD DARRACH

Dr. Donald Darrach of Kensington, P. E. I. died suddenly at his home in his 77th year. When a boy he obtained a scholarship for two years at the Prince of Wales College. He was a brilliant mathematician, one of the best who ever attended that institution. Shortly after finishing his course in it, he entered Bowdoin Medical College, Maine, and afterward Harvard Medical College, graduating in 1872. He practiced his profession at Kensington, P. E. I. for 11 years visiting his Alma Mater nearly every year. He was a member of the Massachusetts Medical Society. Owing to failing health, he retired from practice in 1884, and later on entered into business in which he was very successful. He was an enthusiastic Mason, and had the 33rd degree conferred on him. His name on most occasions headed the list in any philanthropic or patriotic undertaking. He was one of nature's gentlemen. He leaves a widow, three sons and one daughter, the wife of Dr. J. F. McNeill, Summerside.

DR. C. T. CAMPBELL

Dr. C. T. Campbell died in London, Ontario, on February 2nd in his eightieth year. A graduate of the Cleveland Homeopathic Medical College in 1865, he was a member of the Board of Examiners of the Ontario College of Physicians and Surgeons, and was later a member of the Ontario Medical Council. In 1893, he was elected President of the Canadian Medical Council. He served for many years on the London Board of Education, of which he was Chairman in 1884. He was later an Alderman of the city, and, in 1905, its Mayor. He was well known for his researches in the History of Canada and Middlesex, was President of the local Historical Society in the years gone by, and was a contributor on Historical subjects to various magazines, as well as being the author of a work on The Pioneers of London District. For some years, he was lecturer on Sanitary Science at the London Normal School and Victoria Hospital Training School for Nurses. He was well known in freemasonry and was Grand Sire of the I. O. O. F. in 1893-94.

DR. HENRY MEEK

Dr. Henry Meek, for many years connected with the Western University Medical School, died in London on Wednesday, January 11th. He had been at all times interested in the Medical School; was a member of the Exeutive and Professor of Gynæcology until his resignation owing to illness two years ago. Born in Fingal, he began the practice of medicine near Port Stanley, coming later to London, and becoming connected immediately with the Western School. One of the best known surgeons of the Western part of the Province, he was also one of the earliest followers of Aseptic Surgery, and was known for thirty-five years as a skilled Gynæcologist and Obstetrician. Unlike the majority of surgeons, he had acquired a remarkable working knowledge in Neurology and Psychiatry, and much of his remarkable success in his profession was due to the fact that his knowledge of the individual equalled his understanding of their surgical condition. He was a teacher who, by his example and precept, had a far-reaching influence, and, in his death, the profession at large suffers a severe loss.

Dr. Alexander Bryson Osborne died in England on January 28th in his 59th year. A graduate of McGill in 1886, Dr. Osborne soon became one of the best known oculists in Canada. To a remarkable and attractive personality, he added a skill and dexterity which impressed quickly all who came in contact with him. Another of the pupils of the celebrated old Dr. Tassie of Galt, he was one of the characters that remind us forcibly that some of the education in the early days of Ontario left a mark which is quite distinctive. In poor health for many years, he gave up his work when the war broke out to take his part and served in the Canadian Hospital at Taplow. Returning to Hamilton, it soon became evident that his health would not permit resumption of work, and he retired to England a year ago. An active member of all Canadian Medical Societies and a contributor for many years to the Opthalmological Journals, he was also keenly interested in many outside matters, particularly the Canadian Militia, and, as surgeon to the old thirteenth battalion of Hamilton, he was a familiar figure in all military gatherings. He was an active club member and a supporter of the many athletic associations for which the city of Hamilton has been so famous, and certainly one of the best known and best liked personages in the city and its social life.

Book Reviews

The Blood Supply to the Heart in Its Anatomical and Clinical Aspects—By Louis Gross, M.D., C.M., Douglas Fellow in Pathology, McGill University, and Research Associate, Royal Victoria Hospital, Montreal. With an introduction by Horst Oertel. With 29 full page plates and 6 text illustrations. Paul B. Hoeber, 69East 59th St., New York. $5.00 net.

This monograph is the result of a study undertaken by the author dealing with the structural evolution of organs in the various age periods in relation to normal function and disease. The material accumulated in the study of the heart lead the author far beyond the scope of his original investigations and has allowed him to present other observations, and results of investigations. Following a presentation of the technique followed by him he presents: (1) A description of the arterial and venous blood supply to the normal heart with a statistical study of its variations. (2) The blood supply to the bundle of His. (3) A discussion of the anatomical factors concerning the etiology and development of valvular endocarditis. (4) A view of the changes in the cardiac circulation as age advances and their relation to function both physiological and pathological. Injection of the coronary and other vessels were made with barium sulphate suspension in gelatine. After injections the hearts were roentgenographed stereoscopically, cleared, and finally dissected and sectioned. Further by serial sectioning the minute circulatory structure was studied. He not only demonstrates the profuse and abundant anastomoses of the branches of the right and left coronary arteries, but also how these enlarge in the later decades of life, providing for the nutrition of the left ventricle in case of degeneration and partial obliterative changes which may take place in the main trunk of the left coronary in the later decades of life. There are not only anastomoses between the right and left coronary arteries in their capillary and precapillary distribution but between the branches of each coronary artery, and between the coronary arteries and vessels from adjacent attached organs (bronchial, internal mammary, diaphragm, parietal pericardium). The anastmoses in the heart are universal and abundant. In the study of the blood supply to the valves of the heart, it is demonstrated that in the foetus there is considerable musculature present and with this a rich blood vessel supply, greater on the right side, that as foetal life progresses there is regression of both musculature and blood vessels but infant's valves still frequently contain both, that the aortic cusp of the mitral valve is the last to show regression of musculature and blood vessels, that some adult hearts show persistence of valvular vessels, and that practically all cases of valvular endocarditis show a distinct vasculature. It would appear from the evidence presented that there is good ground for the assumption that valvular endocarditis may be embolic in origin. The study of the changes in the coronary circulation in the succeeding decades of life are most interesting and have a great clinical interest. The illustrations of those changes are clear and convincing. Unstinted praise must be given to the author and to Hoeber, his publisher for the excellence of the illustrations throughout the text. No recent valuable contribution to medical science has been better presented either in form, text or bookmaking. There is a valuable bibliography as well as a subject index and index of the personal names appearing in the text.

This research has been carried on by the author while Douglas Fellow in Pathology, McGill University and Research Associate, Royal Victoria Hospital. We learn from a recent number of the British Medical Journal that Dr. Gross has been elected by the trustees to one of the Beit Memorial Fellowships and will undertake microscopic and macroscopic experiments in relation to the condition of intestinal stasis at the Royal College of Surgeons of England and at the Zoological gardens.

J. H. E.

The Anatomy of the Human Orbit and Accessory Organs of Vision. By Ernest Whitnall, M.A. M.D., B.Ch. (Oxon), Professor of Anatomy, McGill University, Montreal; late University Demonstrator of Human Anatomy, Oxford. London: Henry Frowde and Hodder & Stoughton. Toronto: McAinsh & Co. Price $10.50.

This work, as stated by the author in his preface, is primarily intended for the use of opthalmologists; but it is hoped that the necessary incorporation of matter relative to the neighbouring nasal region will

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also prove of interest to the rhinologist, and that as a regional study the whole will commend itself to the general anatomist.

Professor Whitnall's book is deserving of the highest praise. One feels throughout that an enthusiastic teacher is aiming directly at preparing clear conceps for the comprehension of practical opthalmic problems, and, indeed, the work embodies, in an amplified and completed form, lectures that were originally given to candidates for the Oxford Diploma of Opthalmology. The arrangement of the subject is admirable, and, because of a proper appreciation of values, the treatment is at once both comprehensive and concise. The reviewer has been especially impressed by the sections dealing with the accessory air sinuses of the nose, the lacrimal apparatus, and the ocular muscles, as well as by the paragraphs summarizing what is known of the lymphatics and the fascia of the orbit. The value of the work is heightened by an appendix on the cerebral connections of the nerves, which is well done.

The volume is profusely illustrated, especially by a large number of splendid photographs of dissections and preparations, and by numerous original diagrams of merit. One could wish with Professor Whitnall that the cost of colored illustrations had not prohibited their more general use, particularly in connection with the chapter on the vessels; but, by comparison, modern pedagogic requirements are amply met in this connection. A carefully edited bibliography is appended, and the index is satisfying.

After careful perusal the reviewer feels that Professor Whitnall has produced a book, unique in English, that will take its place beside the classic works on the anatomy of the orbit, and one that from now on will be regarded as indispensable to students of ophthalmology. W. Gordon M. Byers.

History of Medicine With Medical Chronology Suggestions for Study and Bibliographic Data. By Fielding H. Garrison, M.D., Lt.-Colonel, Medical Corps, U. S. Army, Surgeon General's Office, Washington, D. C. Third Edition, Revised and Enlarged. Octavo of 942 pages with 257 portraits. W. B. Saunders Company, Philadelphia and London, 1921. Cloth $10.00 net. Canadian Agents, The J. F. Hartz Company Limited, Toronto.

The first edition of this work which appeared in 1913 required reprinting in 1914. It was revised in 1917, and now we welcome the third revised edition. Recent investigations in the history of medicine have added much to our knowledge of ancient and medieval medicine and Dr. Garrison has found a place for the work of others who, like himself, have been doing research in history and progress. Almost 200 pages have been added to his first work while the index has grown from 29 to 42 pages. Likewise the list of notable contributions to medical biography and the history of special subjects has grown from 18 to 32 pages. With the resources of the Surgeon General's Library about him, Dr. Garrison has written a book which can only be described as monumental, filled with a wealth of detail, and demonstrating clearly the stepping stones of progress in medicine and its related sciences. As a reference book of physicians who have contributed to the growth of knowledge it cannot be surpassed, while the large number of portraits it contains adds enormously to the brief but illuminating biographies throughout. He has shown a remarkable ability to measure comparative values and the outstanding men who have left their impress at various times and at various schools are sketched in his own inimitable style. Particularly valuable for reference are his multitude of notes relative to original descriptions of diseases. The medical profession owe a deep debt of gratitude to the author for his painstaking labors in presenting this history which is as nearly accurate as humanly possible in its chronology and references, while the new matter added makes it the most comprehensive history of its size ever attempted. J. H. E.

South America From a Surgeon's Point of View. By Franklin H. Martin, C.M.G., M.D., F.A.C.S. In collaboration with William J. Mayo, M.D., and Francis P. Corrigan, M.D. Introduction by William J. Mayo, M.D., F. A. C. S.

This small volume of pocket size contains a pleasantly written description of a trip made by several members of the American College of Surgeons through the Panama Canal to the chief cities in Peru, Chile, Argentina, Uruguay, Brazil and Bolivia. In addition to the pleasure of making such a trip while our Northern cities were experiencing rough wintry weather, the party had also as an object the furthering of a better acquaintance with the members of the profession in the Southern Continent, and the inspection of their hospitals with a view of noting the character of the surgical work performed in them, and the efficiency of their nursing staff. It was hoped at the same time, that they would be able to interest in the college many of the surgeons they might meet to the extent of establishing branches in the larger cities, and appointing committees on credentials to select the names of several who might be eligible for membership in the college. The pleasures and beauty of the trip are well described and well illustrated with numerous woodcuts. We have read the book with great interest, and can recommend it not only to every member of the American College of Surgeons, but to any physician who may desire to know more of our Southern confreres, or proposes making a trip to some of the most delightful scenes in the world. A. D. B.

Manual of Diseases of the Stomach. By Wm. McLennan, M. B., Honorary Consulting Physician, Western Infirmary, Glasgow. Published by Edward Arnold & Co., London, 1921.

A very serviceable book for the student and general practitioner as there is nothing in it beyond the ready comprehension of any reader. An excellent introduction on the physiology of digestion is followed by concise descriptions of the methods of gastro-intestinal investigations. One is pleased to see a proper consideration of both X-ray methods and chemical examinations, and the inference one draws is that the author relies on no one point to the exclusion of others. There is little that is new in the arrangement of gastric and intestinal disorders though this is not to be wondered at since, after all, the number of diseases of the gastro-intestinal tract is not large. Proper stress is laid upon the influence of the nervous system introducing symptoms, and it is well pointed out throughout the volume that the observer who takes no count of the influence of emotions in producing symptoms in the gastro-intestinal tract. There are one or two small points which need elucidation,Loewi's Test, the dropping of something (Atropine) in the eye, to diagnose a disease of the pancreas, and a description of the vagus nerve with sensory endings capable of conducting pain, certainly do not seem in accord with a clear scientific view. There are more than the usual number of printer's errors. N. B. G.

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EMBRYOLOGY AND PHYSIOLOGY OF COLONIC STASIS

G. E. Armstrong C.M.G., M.D., L.L.D., F.A.C.S. D.Sc.

Montreal

THE importance of the colon is borne in upon us by the recurring experiences of our daily lives. On its periodic functioning depend our health, comfort, mental alertness and emotional outlook to a greater degree than we care to confess. Who is more of a misanthrope than the subject of a loaded colon. Optimism and pessimism in outlook may be decided by the state of the colon, good temper or bad temper, sunshine or cloud in the domestic circle. Recall, too, the contrast between the clear skin and pinkness of complexion on the one hand and the muddy skin and sallow mien on the other hand, the former associated with the functioning and the latter with the non functioning colon. Another fact worthy of note is the extraordinary rapidity with which unloading of the lower bowel is followed by relief of general abdominal discomforts and the re-establishment of a sense of well being.

This responsiveness, this influence for weal or woe, presents the colon to our minds as an organ with a highly developed functional activity closely linked up not only with other portions of the alimentary tract, but with the higher nervous centres. They do not suggest the colon as playing a merely mechanical part, or as a structure of declining importance, a fading evolutionary remnant, to be lightly cast aside as of doubtful utility to its owner.

When we contemplate the many and rapidly changing demands which modern life makes upon our digestive system, and side by side with this the exceeding slowness with which adaptive changes in structure evolve, it is small wonder that there is an increasing strain on functional efficiency and that function gives out. This tax on function is in some measure due to the food we eat and the way we eat it, but perhaps in greater measure to the strain and stress associated with the pace of life.

From this it emerges that the determination of disease in part depends on where stress falls, and how far the individual is able to meet the stress. There is a group of people whose abdomens are over responsive to nerve impressions. Fatigue, anxiety, intensive endeavour manifest themselves in the hollow viscera, and it may be, through the agency of internal secretions. So do reflex disturbances. In some, it may be, the stomach is irritable and hypertonic, and secretes too much hydrochloric acid: such are prone to duodenal ulcer, whereas in others the distal colon is irritable and hypertonic, and has its secretions disturbed: such are prone to colitis. In both of these the prime cause of disease is disordered function and it is curious to note that the first is more common in men and the second in women.''

The words that I have just read to you form the opening paragraph of the annual oration to the Medical Society of London by Lord Dawson of Penn. a man that did wonderfully good work as a physician and as an organizer during the war.

I think that I may assume that the majority of you accept the views expressed by Lord Dawson as approximately correct, at any rate sufficiently accurate to form a basis for further consideration and discussion. The next question that arises, naturally is. Why is it so: I think that the reply would be in general terms, that within the colon are matters that if not regularly and properly disposed of otherwise are absorbed into the body and there interfere with the functioning of the organs concerned in the carrying on of the processes of life. Further thought would evolve the idea that delay or retention is closely related to absorption. Metchnikoff a pathologist, Barclay Smith an anatomist and Sir Arbuthnut Lane a surgeon, have developed this idea, and preached it till we are all familiar with the arguments: it may even be possible that the subject has suffered from being over advocated. You all know, I am sure, the pathology and morbid anatomy of this subject as taught by Lane. Sir Arthur Keith has given a very valuable and enlightening contribution in his discovery and description of nodal tissue situated at different points of the alimentary tract, that control the movements of the stomach and intestines. Indeed it is possible, may I even say probable, that the real pathology of what we term colonic stasis may finally be proven to be a question of nerves.

However, our distinguished British colleague would relieve the situation by removing the colon. As a result of his teaching the colon has been removed many times, and in many countries and by many surgeons. I do not propose to discuss the procedure nor its results at the present time, but will simply say that it is a very major operation, that has not always been followed by the happiest results.

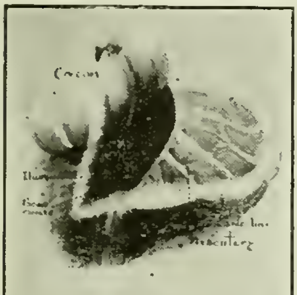
Draper and Lynch in their experimental work found that absorption was particularly active from the caecum and ascending colon. Many surgeons welcomed this finding and treated cases of colonic stasis by removing the caecum and ascending colon and joining the lower ileum to the transverse colon. Speaking for myself I may say that this comparatively simple procedure has given quite as much satisfaction if not more, than a complete colectomy.

A recent experience has suggested that embryology may perhaps throw some light on this question of colonic stasis, particularly if it is found that the caecum and ascending colon are responsible for the toxaemia that results from intestinal stasis.

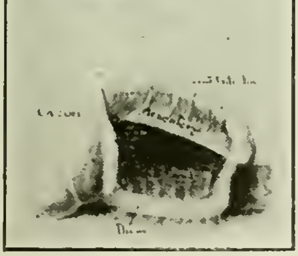
By one of those strange coincidences that we are all familiar with, the two patients presenting the rare anomaly that I now report were in the Royal Victoria Hospital, Montreal, at the same time. The anomaly consists in the absence of a mesentery for the terminal six or seven inches of the ileum.

My own case was a man, age 33 years, sent up to me as a case of recurring appendicitis. He gave a history of having had three attacks at intervals of a month or six weeks. The outstanding feature in his history was the severity of the pain during the attacks. He told us that during the last attack, from which he was just recovering, morphia failed to give relief, and that he had been kept under the influence of ether from 11 p.m. until 6 a.m. the following day. He referred all his trouble to the region of the appendix, and on admission the right lower quadrant was definitely tender. Seventy-two hours after admission I proceeded to uncover the region of the appendix. The condition observed on opening the abdomen was most unusual. The caecum was very mobile, and on pushing it and the ascending colon inwards, the tissues outside the colon were found to be haemorrhagic, ecchymosed, and at one spot the peritoneum was found lacerated. The appendix was curled up external to the ascending colon, and retroperitoneal. It was congested. The area external to the colon looked almost exactly as if he had been kicked with a heavy boot. The terminal six inches of the ileum was subperitoneal. The deficiency in the mesentery began in the pelvis in front of the sacro-iliac synchondrosis, about an inch below the brim. From this point the ileum passes up over the external iliac vein and over the psoas muscle to its junction with the caecum. It was very intimately adherent to the wall of the external iliac vein by means of normal tissue. There was no sign of inflammatory action. The appendix was removed: and the caecum and ascending colon were sutured to the outer abdominal wall by three rows of sutures. So far there has not been any recurrence of symptoms.

The other case was discovered at autopsy. The patient had been under the care of one of my colleagues for a condition not associated with the anomaly. On tracing the small gut downwards, it was found to be free from adhesions or exudate, and apparently ended suddenly at the brim of the pelvis over the right sacro-iliac joint. On lifting up the caecum, which was markedly dilated, it was found to be very mobile, with a definite mesocolon, and to be apparently disconnected from the ileum. This was due to an anomalous condition of the last six inches of ileum. The mesentery ended abruptly at the brim of the pelvis over the right sacro-iliac joint, where the ileum became retroperitoneal and ran posteriorly across the iliopsoas muscle, then turned upwards for nearly three inches, and lay in the groove between the iliopsoas and the quadratus lumborum. It then reached the posterior surface of the caecum, on which it ran downwards for about two inches to approximately its normal insertion at the ileocaecal valve. In this manner, with the caecum in its normal position, it ran a course forming a loop with rather a sharp turn or kink at its point of junction with the posterior aspect of the caecum. This whole loop, when the caecum was lifted up, was completely flattened, and so not noticeable: thus causing the appearance of the abrupt ending of the ileum at the pelvic brim. Manipulation of the small gut and caecum caused this loop to fill with gas and come into view. It is probable that the anomaly caused a partial obstruction under certain favourable conditions.



My own Case



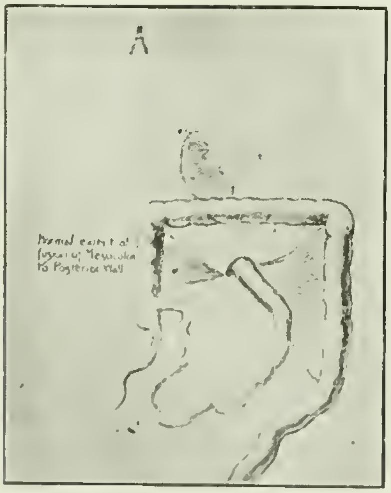
Second Case

It is interesting to note that since these cases were observed, Professor Whitnall (Anatomy) and Professor Simpson (Histology and Embryology) have found two similar conditions in 50 bodies in the dissecting room of McGill University. In these latter there was no clinical history, and no evidence that the anomaly had contributed to the death.

The only similar cases that I have found recorded in medical literature were reported in May, 1890, and published by W. H. Bennett, Surgeon to and Lecturer on Anatomy at St. George's Hospital, and Rolleston, Curator of the Museum. They reported three examples of the anomaly, their attention being called to the condition by the fact that it was "associated with, and probably instrumental in producing a fatal twisting of, the lower part of the ileum." The cases that were observed in the Royal Victoria Hospital differed from those reported by Bennett and Rolleston in the length and mobility of the caecum and ascending colon. In their cases the caecum had not descended into the right iliac fossa, but lay over the right kidney. Moreover, the caecum was small and of the foetal type.

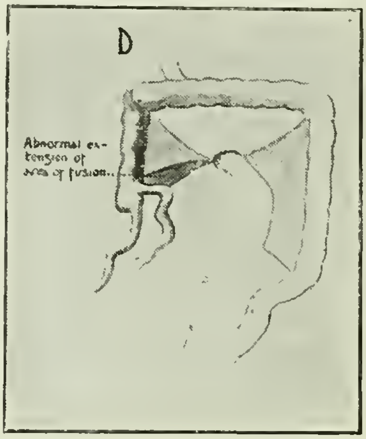
Normally, the ascending mesocolon of the foetus is flattened against the posterior abdominal wall on the right side, and fuses with the parietal peritoneum. The posterior layer of the foetal mesocolon and the foetal parietal peritoneum are obliterated and the anterior layer of the foetal mesocolon becomes the parietal peritoneum of the adult. This fusion of the ascending mesocolon normally begins at the level of the right colic flexure and extends downwards. In the cases described, this fusion has apparently extended low enough to include the mesentery of the terminal part of the ileum.

A very possible cause of this extension of the area of fusion is the presence in the foetal stage of a 'genito-mesenteric fold' which, by putting traction on the developing mesentery, may cause a fusion of the ileum to the posterior abdominal wall. Douglos G. Reid describes a 'genito-mesenteric fold' found in 11 of 20 foetuses examined. It passes from the inferior surface of the mesentery in the right half of the abdomen, forming an antero-posterior septum lying in the vertical plane, and incompletely dividing the portion of the abdominal cavity below the root of the mesentery into two compartments. The smaller of these is on the right side and contains the caecum, the larger on the left contains the pelvic colon. The fold is triangular, and has two attached borders (superior and posterior) and one free (inferior). The posterior border is attached to the posterior abdominal wall along the line of the right spermatic or ovarian vessels. The superior, or mesenteric, border is attached to the inferior surface of the mesentery, often to a considerable extent. This attachment to the mesentery is generally exactly along the line of the iliac branch of the ileocolic artery. The upper part of the fold may persist as the free edge of the duodenorenal ligament of Huschke. Its lower part may persist in the adult, forming the median boundary of the retrocolic fossa, passing from the ileum or appendix. It is the commonest cause of a retrocolic position of the appendix. "The fold may also assist in producing adhesions of the duodenum, caecum, and ileum to the posterior abdominal wall. Adhesion in the adult, binding down the terminal part of the ileum, the caecum, the appendix, the mesentery, the mesoappendix, and even the 'bloodless' fold of Treves, need not be the result of pathological changes, unless the natural causes we have indicated for the adhesion can be excluded, although a genitomesenteric fold may not always be seen, even in the foetus."



I believe that it is generally admitted that the peritoneum does not hold in suspension the stomach, small or large intestine. The organs within the abdomen are held in place chiefly by the abdominal and pelvic muscles. The folds of the peritoneum maintain the organs in their proper relations to each other, but they do not support them at any particular level.

That the caecum and ascending colon are sometimes found dilated and with thin walls is a fact known to all abdominal surgeons. That their content is abnormally slow in passing the hepatic flexure in a percentage of people is demonstrable by the X-Rays. In trying to determine the reason for the unusual delay it seems to me obvious that in addition to poor muscular development and insufficient support one must consider the embryology and the nerve supply to the musculature of the colon. It seems reasonable to assume that in a delayed colon content all kinds of toxic products may result from bacterial action, and one perhaps too readily concludes that the absorption of toxins is the cause of many of the symptoms indicating imperfect function of the colon. Another thought is I think suggested by the part played by the colon bacilli in the production of thyroid secretion. If it is true that the child before birth gets its thyroid secretion from its mother and only manufactures its own thyroxin after the pancreas and intestinal bacteria begin to operate on the protein molecule one may wonder if imperfect functioning of the colon is as simple a matter as some have thought it to be, or whether with further knowledge we may find it bound up with the subject of internal secretions.



There is another question associated with a loaded ascending colon and colonic stasis. Acute arterio-mesenteric obstruction is a condition that is rather well understood now. Many physicians and surgeons of hospital experience have recognized it and seen it disappear rapidly under postural treatment. It is a common experience of surgeons to find, not infrequently, when operating in the upper abdomen, a definitely dilated duodenum. Sir Arbuthnot Lane noticed it and regarded it as one of the sequelae of colonic stasis; i.e. he thought it was evidence of a chronic stasis lower down. A couple of years ago I asked Professor Whitnall if he ever found any evidence of pressure upon the 3rd portion of the duodenum by the superior mesenteric artery. He very kindly undertook to examine the bodies in the dissecting room at the McGill University before giving a reply. He finally repeated that in twenty bodies there was apparent a groove that seemed to indicate that the artery had exercised a degree of pressure on the duodenum during life.

Bloodgood has diagnosed this as a chronic condition in three cases and relieved them by removing the ascending colon. The patients had suffered from vomiting, delay in emptying the stomach with a residuum containing bile and duodenal contents and there was present a dilated caecum displaced into the pelvis. Bloodgood's idea is that this can only occur when the lower end of the ideum has a very short mesentery. Possibly this condition of dilated and displaced caecum may be associated embryologically with the over development of the genito-mesenteric fold.

The different views here expressed indicate that we have yet much to learn about colonic stasis. This much can be stated that removal of the caecum and ascending colon in selected cases is followed by a wonderful improvement in the nutrition of the patient and an increased power of repair and resistance of chronic infections. It is a safe operation and one that is not followed by the troublesome adhesions that are sometimes seen after a complete colectomy.

Value of Drugs in Surgery.—For the maintenance of its essential difference in potential, the cell depends on (a) an abundance of fresh water; (b) oxygen; (c) rhythmic alternations of periods of rest and sleep. These fundamental requirements are the final guide tothe surgeon in his selection of conserving and remedial agents. To insure an adequate supply of fresh water and of oxygen to the cells, as may be required in the individual case, George W. Crile, Cleveland (*Journal A.M.A.*, October 8, 1921) utilizes the transfusion of blood and the subcutaneous injection of water, both of which are given through the organism with increased force and certainty as the result of digitalizing the myocardium. Excessive activation by fear, worry or anxiety, with the resultant concentration of acids in the cells, is controlled by management, aided, when necessary, by bromides or by morphine; by using the readily taken, comparatively innocuous anæsthetic, nitrous oxide-oxygen; by administering the anæsthetic in the patient's room and taking him to the operating room under anæsthesia, and in selected cases, by the preoperative administration of morphine and scopolamine for the purpose of maintaining an even metabolism, that is, an undisturbed internal respiration. Excessive stimulation of the nerve cells by the trauma of the operation is controlled by local, regional or spinal anæsthesia with procaine—the safest local anæsthetic for general use. Post-operative activation is controlled by the application of heat, by morphine, by blocking the traumatized area with quinine and urea hydrochloride. Atropin is used to prevent mucous, especially in operations on the respiratory tract. For the control of excessive metabolism as in post-operative hyperthyroidism, refrigeration, by literally packing the patient in ice, is specific. Bromides and morphine lessen the drive, and aid in securing the state of negativity essential for restoring the difference in potential in the cells. In certain cases in which morphine acts as a stimulant rather than a narcotic, large doses of bromide given by rectum will quiet the patient. Thyroid extract and thyroxin are used to supply the physiologic need in cases of thyroid deficiency; calcium lactate and parathyroid extract in cases of parathyroid deficiency. Alcohol and strychnine are rarely used. The fo.-mer is of value in certain apathetic infections, especially in the aged or in those who have been accustomed to it. In general with the exception of the employment of digitalis to stimulate a weak myocardium, the use of stimulants is scarcely worth while and may be harmful. The use of a solution of sodium bicarbonate as an agent for combating shock is of little, if any, more value than water. In both war and civilian practice, it has been found that solutions of gum acacia not only have no value but probably have caused a number of deaths. Glucose solutions are of little value.

THE NEXT GREAT ADVANCE IN MEDICINE*

PROF. A. B. MACALLUM, Sc.D., F.R.S.

In Perpetuum, Frater, ave atque vale!

IN selecting as the subject of my address to-day "The Next Great Advance in Medicine," I have been influenced by the reflections and observations of thirty years on the trend of the development of Medicine as a Science and on the possibility in our day, or in the immediate future, of the discovery of a new line of advance which may result in recasting much of our knowledge of disease and of adding to it to an extent that will signalize the discovery as epoch-making. I am indeed not the only one who has had such reflections and made such observations. There are to-day quite a number of leading members of the profession and of the more prominent teachers in the Sciences ancillary to or classed under Medicine who feel that progress under the present trend of development has slowed up because the methods and the lines of attack in our present activity have been exploited very fully and further effort results in the addition of details, not general facts or outstanding principles, to our stock of knowledge.

There are even some who have initiated or have attempted to initiate new movements which they hope and believe will contribute greatly to our knowledge of disease. Indeed one of these is already under way and under the leadership of the distinguished clinician, Sir James Mackenzie, who has organized at St. Andrews a group of experienced clinical observers with the object of systematically studying the beginnings of disease by examining periodically and over an extended period, a large number of citizens to ascertain the course and the character of the initial stages of every pathological condition found. This movement which has been called in the press the "Newer Medicine" and by Sir James is regarded as the Medicine of the Future, has resulted from despair or a greatly lessened hope that the achievements of scientific research of the prevailing kind are likely to add much that will be signally important to our present knowledge.

That there will some day be a greatly lessened rate of progress or that Research will then have achieved its utmost may for the moment be conceded, but I do not think that day has arrived or even that it is to dawn before many centuries have passed. There are some great fields in Medicine yet to conquer by research and human ingenuity and the capacity to explore in a great pioneering way has not yet been exhausted. In consequence we may still look for developments which will mark noteworthy stages in progress in scientific Medicine and it is not too much to hope that one of these stages is near at hand. Indeed this hope itself, if stimulated, may prompt the keen and highly trained among the younger generation to attempt a new path of advance and it is with the object of stirring ambition to endeavour in a new field that I am addressing you on this subject.

There have been such stages in the development of the Science of Medicine in the past. Indeed the history of Medicine is the story of successive stages in each of which some emphasis was laid upon one or other view or doctrine which dominated the outlook of Medicine for the time. The Medicine of the ancient Greek and Roman world was a succession of eras each of which had its own special prevailing view, until Galen's teachings which held sway for nearly fifteen hundred years began to displace the doctrines of the various schools of the time. The cult of Galen was followed in the seventeenth century by a return to the old Hippocratic traditions and doctrines and these dominated the profession of Medicine until the middle of the nineteenth century. Owing to the progress that the Sciences of Chemistry and Physiology had made in the first half of that century the thinkers and leaders in Medicine began to turn to other theories and schools for a system which would permit of a new line of development. In consequence the era of Cellular Pathology began with the researches and teachings of Virchow and many of the foremost in the profession of Medicine in the fifth, sixth and seventh decades of the last century believed or hoped that a new era had dawned for Medicine, an era in which all the lore of Medicine would be systematized by the knowledge which research in Cellular Pathology would produce. That Cellular Pathology was of great service and helped to advance our knowledge of the real characters of a number of diseases, those due to neoplasms especially, and also of the causation of some, cannot now be gainsaid, but it did not fulfil the hopes of those who sixty years ago were enthusiastic in their belief that it had introduced a new order in Medicine.

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*Address delivered at the Formal Inauguration of the New Medical Buildings of the Western University, November 18th, 1921.

A new aspect began with the development of the knowledge of bacteria as an important factor in the causation of disease. The work of Pasteur on the nature of fermentation and the recognition that bacteria and yeasts play an all important part therein directed attention to the possibility of putrefaction in the wounds as well as fermentation may be due to such organisms. Lister in 1863 in consequence began to formulate the view that all putrefaction and the formation of pus in wounds are caused by bacteria and that to obtain the natural healing of such wounds of organic tissues or of structures exposed in surgical operations it is necessary to exclude completely bacteria, or if present , to sterilize them. This conception, after a struggle of nearly twenty years which preceded its general acceptance, led to methods in wound treatment which have revolutionized Surgery during the last forty-five years. The recognized value of such methods prepared the minds of many in the scientific world for the acceptance of the view that bacteria are the causative factors in a very large number of diseases, an acceptance that was reinforced by the results of the researches of Koch in the early eighties on the causation of tuberculosis. Since then Bacteriology has played an almost all-important part in the development of Medicine. The microorganisms have been hunted down in a very large number of diseases and in consequence we now know very much more about their causation than any one sixty years ago would have deemed possible.

The researches on the part played by bacteria in the causation of disease have led to the development of a new department of knowledge, that of the defense of the organism against the attack of pathogenic bacteria. This department, known as Immunology, because of the service it has rendered and which, further, it is capable of rendering, has very greatly contributed to giving a cast to our knowledge of the treatment of disease which will render the achievements in Scientific Medicine of the last forty years forever memorable.

Cellular Pathology, Bacteriology and Immunology have therefore each in turn assisted in developing our knowledge of Medicine from the scientific side and research in these lines in the years to come will still further augment our knowledge. It is scarcely likely, however, that such researches will do more than fill up gaps in our knowledge of these subjects. No great or striking advances will be possible from them alone for their conquests in the future will not embrace the discovery of any great new principle or generalization. There will be discoveries along these lines but these will concern details, as it were, not general principles or ideas likely to transform or greatly alter our viewpoint of the treatment of disease on a rational scientific basis.

Is there then no other line in which great or striking achievements in the Science of Medicine are possible?

There are indeed other Sciences which have in the last half century made very important contributions to progress in this science. These are Physiology, Pharmacology and Biochemistry. Physiology has greatly increased our knowledge of the functions of the various organs of the body and has thus enabled us to understand more or less clearly the part they play in disease. We can comprehend more fully than was possible forty years ago the phenomena which obtain in lesions of the nervous system, simply because through physiological research and clinical and pathological studies we know now a great deal more of the functions of the centres and of the various fibre tracts of the brain and spinal chord. Our knowledge of the internal secretions, in the last fifteen years greatly enhanced, permits us to understand what occurs when any one of these cease to form in the body. With the aid of physiological research we can recognize what may be involved when portions of the alimentary tract are affected by disease and also explain many of the phenomena of disease of the circulatory and excretory organs—and so on throughout this domain in which research has given us a knowledge of the functions of the organs which is of inestimable value.

In Pharmacology we have a lore which has been forged by the enthusiastic efforts in research of three or four decades. It is exact and pertinent to our command of the use of many of the drugs and compounds included in our pharmacopoea and we employ them to-day not empirically. except in some cases, as they of the last older generation did very largely, but with a more or less clear appreciation of the effects which such drugs and compounds exercise on the body or its organs.

All this is to the good but these conquests in Physiology and Pharmacology have not served to initiate a new and striking phase in the development of Medicine as a Science. They were necessary to and inevitable in any advance and their value should not in the slightest be underestimated. Without them, in the treatment of a number of diseases the ablest and otherwise most highly trained practitioners of Medicine would proceed under an enormous handicap..

Physiology and Pharmacology, like Pathology, Bacteriology and Immunology, will by research each develop in the years to come a larger and more precise body of knowledge and thus Medicine as a Science will become a larger, more precise and more stable body of knowledge, but, as the years pass, unless a new line of development is sprung in these two Sciences, there will be gradually lessening gains in the form of new knowledge as rewards for all the efforts expended in research in them.

What then of Biochemistry? Shall we say of it that its days of great achievement are in the past or yet to come?

Biochemistry, with the exception of Immunology, is the youngest of all the Sciences which lie at the foundation of Modern Medicine since it, as a body of knowledge independent of Physiology and Chemistry, does not extend back of the late "seventies" when it. under the leadership of Hoppe Seyler, had to contend with the representatives of those Sciences for recognition as a distinct field of scientific research. Its achievements in the last forty years have justified the claims then advanced in its behalf and some of its conquests have marked very distinct advances in our knowledge of the chemistry of living matter. Through the researches of Emil Fischer and biochemists of the last thirty years we have obtained a knowledge of the constitution of proteins which was, it would appear, beyond the dreams of the biochemists of any earlier time. The fundamental integers in the composition of these very complicated compounds are amino-acids which are united to each other like the links in a chain. As there are nineteen amino-acids the presence of some of these and in different proportions, or the complete absence of others in the molecular make-up accounts for the great diversity in character of the multitude of proteins which we now know. Further, we know, as the result of the researches on the digestion of proteins in the stomach and intestine, that they are decomposed to set free the amino-acids in them. They are absorbed as such and either serve as "building blocks" for the proteins which the tissues of the body synthesize or undergo decompositions, either complete or partial, which furnish as end products the urea and other nitrogen-holding compounds excreted by the kidney. The results of such researches have thrown a flood of light on the nitrogenous interchange of the body and all these with the knowledge which has been gained from very extended observation and experiments on the energy interchange have placed the subject of nutrition on a firm unshakable scientific basis. The role of proteins, fats and carbohydrates in a diet thus ascertained make it henceforth possible to determine definitely and accurately the relation of diet to a great many of the diseases of nutrition, a relation which I believe is capable of yielding a great amount of knowledge which will be of immense service in the treatment of such diseases.

All this has been achieved gradually and without any striking or dramatic result at any stage in the development of all this knowledge. It has modified the outlook in the Science of Medicine and also the treatment in a number of diseases but this alteration in the view point has been brought about gradually as the knowledge was obtained. In consequence the value of it was not appreciated as it would have been had some of its more striking facts been ascertained in a few years instead of over a period of more than three decades and, accordingly, this knowledge did not appear to rank in importance with the conquests of the Cellular Pathology, Bacteriology and Immunology.

There is, however, one field of Biochemistry in which new and all-important facts have been ascertained in the last sixteen years, facts which have compelled us to revise very greatly our views as to the constitution of a normal diet. The diet accepted as standard till 1905 comprehended proteins, fats and carbohydrates, together with salts, in certain proportions and quantities daily of each and it was not dreamed even that there must be other constituents of the same in order that life free from disease be maintained. In that year Professor Gowland Hopkins, as a result of feeding young animals on such diets constituted of purified proteins, fats, carbohydrates and salts, all derived from milk, found that either they did not grow or quickly succumbed, while other young or adult animals similarly fed grew or remained in a healthy condition if a small quantity of milk, not exceeding a cubic centimeter in quantity, were added daily to their diet. He concluded from these experiments that there are other constituents necessary to a normal diet which cannot be classified either as proteins, fats, carbohydrates or salts and which play a dominating role in growth and nutrition generally. These he termed Accessory Food Factors. The importance of these observations was not at once appreciated but attention was directed to them specially seven or eight years later by the results of experiments by Funk on feeding pigeons on polished rice, that is, rice from the grains of which the pericarp covering has been removed by a milling process. The animals so fed developed polyneuritis in a marked degree but he found that an extract of the coverings removed from the grains in the process of polishing, when injected intravenously into a pigeon in which polyneuritis had been thus induced, cured it of this disease in a few hours even if before the injection the animal was in the moribund condition. This was in line with the observations of Eijkmann who in 1898 found that beri-beri, a disease which was at times a scourge in the East, and in which polyneuritis is the most pronounced symptom, is due to a diet of polished rice alone. Funk endeavoured to isolate the curative substance from the polishings and obtained it in a concentrated but impure form which on further attempts at isolation decomposed. As he regarded this substance or compound as of vital significance in nutrition he coined the name "vitamine" to designate it.

It was later found that there are other compounds in the food stuffs which are as essential to a normal diet as the antineuritic one which occurs in the rice polishings and which, by the way, has been found in other food stuffs. One or more of these occur in the fats of milk and exercise a remarkable directing effect on growth or on the nutrition of growth, for in diets free from it or them growth will cease, rickets may develop and an affection of the conjunctiva of an ulcerative character may supervene. Further it is now known that scurvy is caused by the absence from a diet for a time of a compound which is present in green vegetables or fresh meat. These substances are now popularly known as vitamines because they equal in their importance, as regards their effects on growth and nutrition, the vitamine of Funk.

None of these compounds have been isolated in a pure form and their chemical composition is therefore unknown although the efforts to this end of a very large number of biochemists have been concentrated on them during the last five years. They are present in foodstuffs in very minute quantities and accordingly the labour of isolating them, if suitable methods for this purpose were found, will task not only the enthusiasm but also the patience of those attempting it. Their importance is such, however, as to insure the accomplishment of this object some time in the near future.

To appraise fully what the discovery of these compounds and what their role in nutrition implies is to recognize also that we have in the knowledge gained of them the beginning of a new and important phase of the development of Medical Science parallel with that inaugurated when the science of Bacteriology began to play a part in the advance of our knowledge of the causation of disease. I am strongly of the opinion that when the composition of these compounds has been definitely ascertained and they are isolable in sufficient quantities to serve for determining accurately their action, we shall have an insight into some of the more profound problems involved in the activities of living matter.

It would seem from the experiments of McCarrison and others on the effects of vitamine-free diets on animals that the intestinal canal is one of the organs of the body primarily concerned. Under no other circumstances is the intestinal tract so markedly affected, for the constipation which develops is soon followed by an extensive sloughing away of patches of the mucosa throughout its extent. There are other results. Bacteria gain free, almost direct entrance into the blood vessels and there ensues an hypertropy of the pituitary and adrenal glands with more or less atrophy of other endocrinous organs. The signal result is, however, the extensive necrotic lesions of the intestinal mucosa.

It has been suggested that the primary action of the vitamines is to control the activities in absorption of the intestinal mucosa. That it may do so may be correct but it is probably a very inadequate summary of the influence which they exercise, for it would seem that they exert a vital effect on other structures and that the normal activities of the tissues generally depend on a constant accession of such compounds to them.

The effects of avitaminosis on the intestine is striking because of all the organs of the body there is none which performs such a variety of important functions as the intestinal mucosa does and, therefore, a deficiency of vitamines in the diet must result in more serious disorders than may obtain in other organs. What all these functions are we do not know and accordingly how the vitamines contribute to normal conditions as yet is an enigma. Here also is a new line along which a great advance may be made.

The chemistry and physiology of the intestinal mucosa is a subject which in the past has not received the attention it deserved. The intestinal mucosa is one of the great gateways of the body to disease. It is constantly exposed to the action of products of bacterial fermentation and when these are toxic the epithelial cells are the first to experience this action. In fact there are no other cells of the body which are subject to such an extreme variety of conditions and to such a constantly changing environment as are the epithelial cells of the intestinal mucosa. They undoubtedly react to a number of these and neutralize the toxic products and these cells constitute thus the first line of defence of the organism against disease. When they fail to act in this capacity disease begins in one or more of the organs and as this continues then disease develops of a type consistent with its origin. There are many facts which appear to indicate hepatic cirrhosis, several kinds of nephritis, arterio-sclerosis, angina pectoris, senile dementia and dementia precox are all due in great part to alterations in the capacity of the epithelial cells of the intestine to perform their normal functions.

What changes the epithelial cells undergo to permit of the development of the diseases mentioned we do not know. But we know very little regarding the activities of the cells. We recognize that they are active in the absorption of the products of digestion such as amino-acids, glucose, fructose, galactose, soaps and even unsaponified fats, but concerning the processes involved in this absorption we have only a very limited knowledge. Indeed our acquaintance with the intestinal epithelial cell is that derived from its morphological characters, characters which can be examined in an ordinary histological preparation of the intestinal mucosa but which do not give much insight into the physiological and chemical activities of the cell itself. Some of the processes involved in its absorption of fats can be followed under the microscope but the interpretation of what is so observed is the subject of debate to-day. We know also that the epithelial cells vary in function from the commencement of the duodenum to the termination of the ileum and that the secretions of the duodenum and jejunum differ in some marked degree from those of the ilium but this knowledge is very scanty or on a number of points exceedingly inadequate.

The reason why our information as to the activities and functions of the intestinal mucosa is so scanty is that we have not refined our methods of the study of the living cells in general and more particularly of the intestinal epithelium. The Physiologist and Biochemist are content to fashion their explanations of the phenomena of secretion and absorption by intestinal epithelial cells on the basis of their morphological structure alone. No effort has been made to discover other methods of a microchemical kind, the use of which will permit us to examine the cells in their various phases of activity and determine how they are affected through exposure more or less prolonged, to the action of the toxic elements in the contents of the intestinal canal. These methods will involve microchemical reactions of a very delicate character but which have yet to be discovered. That there are none such known is no indication that they are impossible. Twenty-six years ago, when the author began his investigation of the absorption of iron compounds by these cells delicate microchemical reactions in tissues were practically unknown but as a result of the work then done we have to-day a reaction for inorganic iron which is so sensitive as to reveal in the intestinal epithelial cells all the details of their absorption of unorganic iron compounds. Seventeen years ago there was no delicate microchemical reaction for potassium, when the author endeavoured to localize microchemically potassium salts in animal and vegetable cells and as a result of that effort a delicate microchemical reaction for potassium is now at our command which enables us to localize under the microscope the faintest trace of this element in living cells and accordingly we can determine with the results of this reaction variations in the surface energy in the living cells which could not otherwise be revealed. We have also discovered very sensitive reactions for phosphoric acid as phosphates and for chlorides in the living cell which enables us to locate their distribution therein. Is it, therefore, too much of a "pipe dream" to hope that in the near future we shall discover microchemical reactions which will be decisive in revealing under the microscope in living cells constituents whose distribution will be indicative of what takes place in them? Indeed I am certain that in the near future a new generation of Biochemists will discover colour reactions for at least some of the amino-acids, the products of the digestion of proteins in the intestinal tract, for glucose and fats and soaps which will enable them to follow the course taken by these substances through the intestinal epithelial cells and for toxins which will permit them to investigate the effects of these not only on the intestinal epithelium but on the tissue elements of other organs of the body. With this armamentarium the physician of the near future will be in a position to understand the causation of a number of diseases which is now beyond the ken of the etiologist of to-day.

Amongst these will be those due to changes in the character and activity of the intestinal mucosa, and in large part, of its epithelium. Perhaps to such listed above we may add diabetes mellitus. In this disease there is a failure of the power of the tissues of the body to utilize sugar, a failure due to disease of the pancreas which in its normal condition is supposed to furnish to the tissues some internal secretion that is concerned in this utilization. This is the general view but there is also at certain stages of the disease a failure to metabolize completely the fats of the body. That other organs than the pancreas are involved in this disease seems to be borne out by the observations of Dr. Charles Workman, made about twenty years ago to the effect that in all the post mortem examinations of cases of diabetes mellitus which he made there was a very marked hypertrophy of the duodenal portion of the small intestine. The significance of this has never been investigated and this is a signal illustration of the lack of interest which has more or less characterized the attitude of Clinicians, Pathologists, Biochemists and Physiologists in regard to the part played by the intestine in the causation of disease. It will be quite otherwise in the years to come. I am firmly convinced from all my observations on the intestinal mucosa from the biochemical side that the greatest advance in Medicine of the next three decades will be based on the results of investigations of the chemistry of the intestinal mucosa which, as already stated, I regard as the great gateway to disease of the body.

It is evident then that we need not yet despair of the development of new and great lines of advance in Medicine which will yield results probably of as signal a character as those won at any time during the last half century. This will involve, not a discarding of the valuable part of the lore we already have, but a recasting of it as the years pass, and we can consequently look forward to a time when the Science of Medicine will be a splendidly organized body of knowledge of supreme service to mankind. Let each, therefore, of the younger generation amongst you take heart and prepare, if it is at all possible, to take part in this advance.

The vision is also for the Faculty. It must now, more than ever, aim at a high standard of achievement in all the lines of endeavour which characterize Scientific Medicine. The teaching and facilities offered to students in the Professional Departments must be, as they are now, of a kind that will satisfy the most exacting critic, but this will not be all-sufficient if there is not ample provision for developing research in the Scientific Departments, and if, at the same time, there is not the spirit and the effort made to keep step with the scientific legion in research. By prosecuting research the members of the staff qualify themselves for this teaching and to be known as researchers is to have a reputation with their students which will drive home what they give in the lecture room and laboratory. In after years the graduates will feel a pride that they have been taught by some who have endeavoured to explore the unknown and have in some measure added to the stock of knowledge in their lines of work. To such teachers there will also be a greater guerdon than all these. Life's values change with the years and some are wholly discarded, but to the scientific worker of the true type there is one that does not depreciate even throughout a long life and that develops in achievement in research. To have contributed, and to be contributing to knowledge introduces one to the camaraderie of the scientific world and brings in the end a world-wide recognition for unselfish endeavour. Above all, it brings the researcher, as far as an individual life may go, in contact with Truth, and in Chaucer's words, Truth is the highest thing that a man may keep.

The scientific worker also will find in research, indefatigably pursued, a consolation for many a defeated hope, many a disappointment, and in later years it will give a pleasure to life that no other occupation, however sedulously followed, will yield.

On the younger members of this Faculty and on the students even who are desirous of qualifying for a scientific career in Medicine or one of its Sciences I would therefore urge unceasing endeavour in the exploration of the unknown, each along his own line, all in the spirit of Ulysses as Tennyson represents him,—

------ strong in will,
To strive, to seek, to find and not to yield,

and

To follow Knowledge like a sinking star
Beyond the utmost bounds of human thought.

OLOF HAMMERSTEN, PHYSIOLOGIC CHEMIST.—The present year has included the celebration of the eightieth birthday anniversary of the distinguished Swedish physiologic chemist, Olof Hammarsten, who was born August 21, 1841. To American medical readers he is well known as the author of a remarkable text-book of physiologic chemistry which, in its German and English translations, served an entire generation in the training of students in this branch of science. For many years it stood almost alone and unrivalled as a dependable reference book—a veritable encyclopædia of the progress in the chemical aspects of the physiologic sciences. Edition after edition attested the indefatigable energy and broad erudition of Professor Hammarsten of the University of Upsala. This work has truly left its impress on a considerable number of American physiologists and biochemists; and it is interesting to recall that the pioneer textbook on animal chemistry by the eminent Berzelius likewise was contributed from the Scandinavian peninsula by a professor of medicine and pharmacy a century ago. Time passes so rapidly that one generation of students takes for granted what their predecessors recognized as novelties and physiologic history in the making. In addition to book-making, Hammarsten's contributions to his science were manifold Half a century ago he made the fundamental observations on the milk-curdling properties of the gastric juice and the behaviour of rennin He pointed out the rôle of calcium in the clotting of both milk and blood. To Hammarsten we owe many essential facts regarding casein—the chief protein of milk— the proteins of the blood, the mucous substances in the bile and other secretions, the bile itself; and his continued fruitful scientific activities are still evident in papers which have appeared in recent months. The eminent physiologic chemist of Upsala remains as a living example of the many-sided investigators who have almost disappeared in the present age of extreme specialization.—*Jour. A.M.A.* November 12, 1921

GLIMPSES INTO ENDOCRINOLOGY

W. F. Hamilton M.D.

Montreal

As ONE looks back over the records marking the development of our knowledge of the internal secretions, one finds that about the middle of the 18th Century, Bordeu ascribed the changes seen after castration to a lack of testicular secretion in the circulating blood, while about one hundred years later, Berthold of Gottingen, demonstrated that by castration and testicular grafting, cocks retained their sexual characteristics.

About the same time Graves, Claude Bernard, Gull, Ord, Schiff and Gley were actively engaged in experimental and clinical work with the testicles, thyroid, liver and other glands. Bernard advanced the view that every organ in the body possessed an internal secretion, which passing on to the blood, determined its composition and action.

The views of Brown Séquard. in 1889, are too well known to need repetition here; yet it may be recalled that opinion is divided as to who was the great leader in this field of study, Claude Bernard or Brown Séquard.

In 1891 the treatment of myxœdema was earnestly begun by Murray, of Manchester. The work of Oliver and Schafer on the functions of the chromaffin tissue in 1894, of Halsted on the Thyroid, of Cushing on the Pituitary body, not to mention other publications, are epoch-making. None the less so perhaps are the isolation and synthesis of adrenalin by Takamine in 1901, and the separation of thyroxin by Kendall and his associates in 1914. During the last five years studies in basal metabolism have so far advanced that the activity of the thyroid gland may be accurately estimated and the fluctuations of the metabolic rate under varying doses of thyroxin closely followed.

Theory finds a large place in explaining the action of the glands of internal secretion. There seems however sufficient evidence to show that these glands are influenced by the central nervous system, while at the same time they possess a certain degree of autonomy, most marked in the sex glands, and least marked in the chromaffin tissue. (Falta) Schafer regards their secretions as excitants or depressions of cellular activity; as a result, muscular tone is altered; chemical changes are initiated, accelerated, or retarded; body weight is increased or diminished. If we would wish a broader term by which to describe their action, choice may be made of Noel Paton's phrase, in which all these glands are called *regulators of metabolism.* Experiments with thyroxin, are already most illuminating, giving at the same time promise of further discovery in other fields.

With so much of clinical importance resulting from recent war studies it does not seem remarkable that they should afford abundant opportunity for advancing knowledge on this subject. The glimpses afforded by Pende's study in this connection are very suggestive. To hormonic imbalance, or, endocrinopathic temperament or *habitus,* the writer would attribute a vast number of what he calls the war syndromes, such as the psychoneuroses and the irritable heart of the soldier; while even certain infections, including tuberculosis, are included.

Early in the war McKenzie explained the "irritable heart of the soldier" on the basis of infection and fatigue which increased neuromuscular irritability, and who can say that this view is not well founded? Pende, however, urges the view that in many soldiers developing these syndromes, there was already the "habitus" endocrinopathic, which rendered them unable to bear the extraordinary influx of psychic disturbances on body life incident to war."

By the above glance at the history of the advance of knowledge of the ductless glands, enough has been recalled to show that growth, form, sex-characteristics, emotion, nutrition, lethargy, excitability, etc., are dependent upon the normal or abnormal function of one or more of these structures. The conditions induced in man and other animals by operation and experiment, as well as those which accompany arrested development, infection, or tumors of these glands demonstrate their vital importance.

"The oldest and most valuable information on the internal secretions" says Biedl, "is that derived from clinical observation." Bramwell repeated and emphasized this view. It may therefore be of interest to pass in review a few chosen cases as illustrations.

The first case illustrates certain physical and mental characteristics associated with abnormal glandular conditions. H. H., male, at 25 years was 4' 7" in height and weighed 76 lbs. He developed normally until ten years of age when he began to have dizziness and at times double vision. For fifteen years he had attacks of frontal headache and vomiting. During this time his development both physical and mental was slow and unsatisfactory. When seen in the hospital, the skin was pale, pasty, dry and inelastic, with a considerable amount of subcutaneous fat. The patient appeared rather stupid and apathetic with slow response to questions. The voice was thin and childlike. The head was large and the scalp thinly covered with harsh coarse dry hair. There was no hair in the axillæ or on the pubes (hypotrichosis) The genitalia were small and undeveloped, the testicle had descended. The symptoms of an intracranial tumor, possibly of the pituitary, were recognized in headache, vomiting and optic neuritis and coma. The patient died after a few months of intermittent observation, having been in the wards three times. The autopsy showed a tumor of the pituitary and choroid plexus, atrophy of the thyroid, adrenal and testes, porencephaly, œdema of the right optic nerve, *persistent thymus*, adiposity and effeminate characteristics. Dr. Oertel's report on the histology of the tests is as follows:- "In general the appearance of the testicle is that of an undeveloped puerile organ. With few exceptions, the tubules are small and narrow .... The several layers of epithelium lining the tubules present generally the undifferentiated appearance which is characteristic of the time before puberty.

The almost entire absence of the interstitial cells of Leydig is striking. There are only a very small number of cells, which, while not characteristic of typical Leydig cells, may be embryonic forms. We have to do with an immature and probably non-functioning testicle corresponding to the puerile testicle before the time of puberty. It would seem that there had occurred a standstill in the proper development of the whole testicle. "In this case there was *infantilism* associated with a pituitary tumour, and testicular defects, especially of the *interstitial* cells of Leydig."

Over against this case of a male of 25 years, one may present in outline and contrast a report of a case which will be published in detail by Drs. A .T. Henderson and W. H. P. Hill, whose kind permission to make use of it on this occasion was given me a few days since. The patient, a lad of five years, while at play, fell on the ice and soon afterwards showed signs of an acute and painful condition in the abdomen, most marked in the right upper quadrant. He showed on examination, in addition to the signs and symptoms of suffering, a development in one so young that arrested attention. The voice seemed to be that of a youth undergoing *change;* permanent teeth were in evidence; pubic hair was fairly abundant with hair on the upper lip and in the axillæ and on the extremities. The external genitalia resembled those of a boy of sixteen years. Erections were occasionally noticed. Surgical measures revealed a retroperitoneal tumour with large recent hæmorrhage in the right upper quadrant of the abdomen. The tumour was removed and after a severe illness the patient is now quite well, while the secondary sexual characteristics once so well marked have largely disappeared.

The pathologist in his report on this tumour, states that it is a tumor of the adrenal cortex—so called hypernephroma.

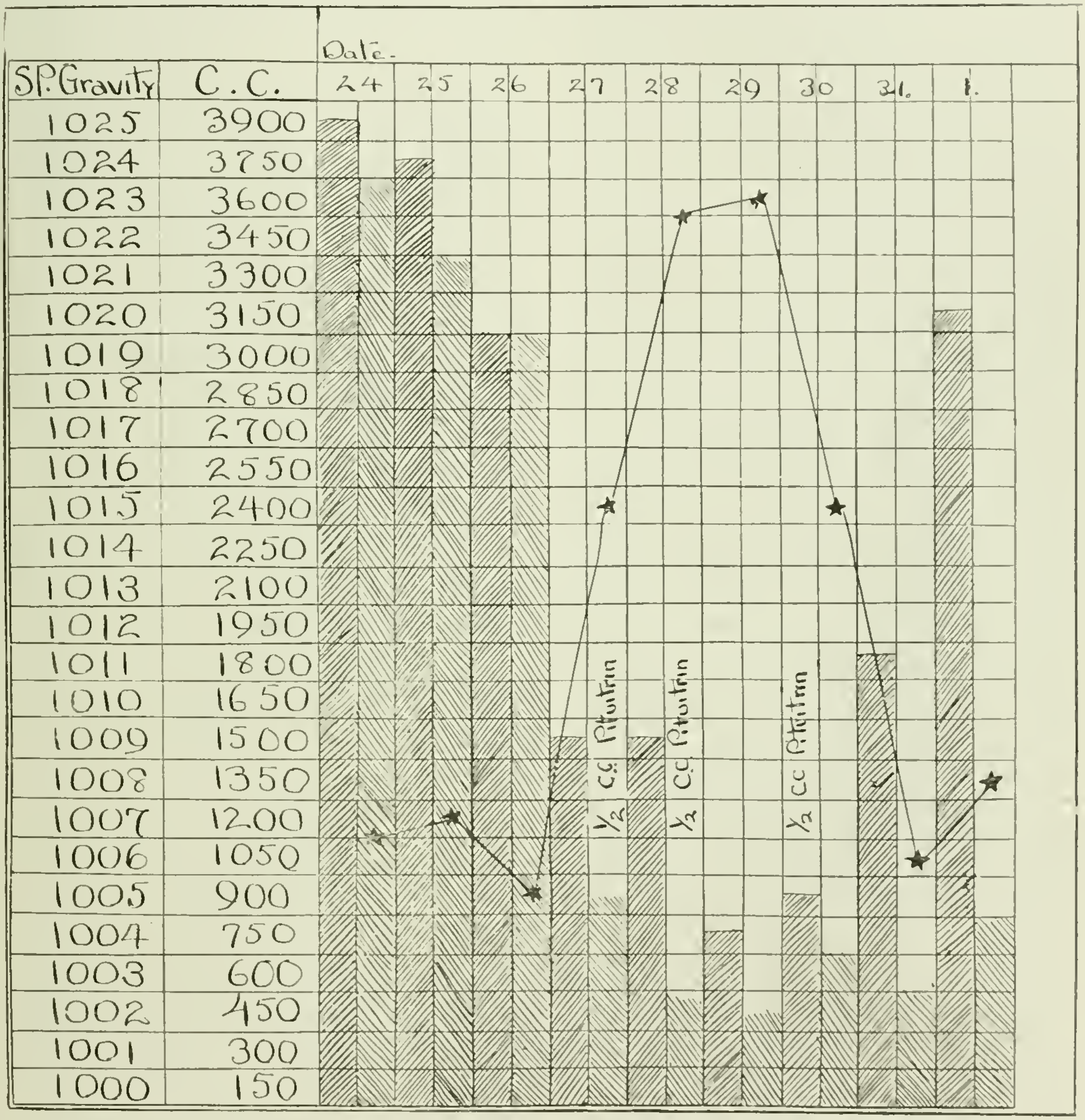
The youth in our first case remained in a sense an infant, because of a tumor: a pituitary or hypophyseal tumour. The child in our second case, was or was about to become a man because of a tumour in the right adrenal cortex.

Cases of pubertas præcox in the literature are comparatively few. A tumour of the pituitary, pineal gland tumours and tumours of the adrenal cortex are reported associated with changes above described. Such cases may be classified as pubertic precocity, a form of hypergenitalism due to affections of one or other of these organs. On the other hand testicular tumours may induce pubertic precocity, a form of primary hypergenitalism. These clinical features may find their relationship and explanation in the histological similarity of the cells of the cortex, inter-renal cells and the interstitial cells of the sex gland. (PATON P. 175.)

We may now turn to another aspect of endocrinology, not less interesting. It is now upwards of sixty years, since Thomas Addison so cleverly associated the syndrome of asthenia, bronzing of the skin, and diarrhoea with disease of the supra-renal capsule. During this time, nothing has transpired to detract in any way from the value of his original observation. While the pathogenesis of this disease may have become clearer and diagnosis more definite, yet Addison's views on prognosis in these cases have seldom if ever found an exception in literature. An outline of a case observed some years since may be of interest.

A female, aged 30 years, servant, was admitted in June, 1906, having complained of weakness with nausea and vomiting recurring over a period of six months. From time to time,

DIABETES INSIPIDUS.



Total daily liquid intake in **BLACK.**
Total daily urine output in **RED.**
Specific gravity ★———★

Note the marked effect due to the hypodermic use of Pituitrin lessened output — increased sp gr.

the patient needed to rest in bed three or four days, so great was the weakness; the appetite was poor, the bowels always constipated. Small dark spots were seen first in January upon her face. In March the forehead showed a definite staining and from her description the change in her skin spread rapidly to hands, and arms, with increasing weakness described as "utter unfitness for her work." Several years previous to this illness, the patient made a good recovery from an attack of right-sided pleurisy, while the family history gave but a remote connection with tuberculosis in a paternal uncle who died with that disease of the lungs. The pigmentation in this patient was most striking. Visible from afar, the hands and face were walnut in color, while near-by inspection revealed numerous spots, dark-brown or even black. All moles were almost black while the mucous membranes of the mouth and gums and conjuntivæ exceeded in the depth of colour all other cases yet seen. The left pulmonary apex showed numerous rales as of a cicatrix due to tuberculosis. The liver was palpable. The menstruation had been regular. The urine gave a faint reaction to the test for albumin. The blood examination showed slight anæmia; red cells 3,900,000, white cells 8,200, Hæmoglobin 85 per cent. The systolic blood pressure records were subsequently made with a maximum of 95, and a few days before the patient sank into stupor and coma which soon ended in death, the blood pressure stood at 68.

The pathologist's report showed that tuberculosis was wide spread and chronic, with fibrosis, calcareous deposits and many adhesions of pleura and pericardium: the right adrenal was adherent to the inferior vena cava, the left to the stomach. In summary Dr. Klotz wrote "a very typical case of bilateral caseous and calcareous affection of the adrenals with caseation in the right gland associated with great atrophy and in both firm adhesions to the surrounding viscera."

In reviewing this case, the acuteness of its course, the intenseness of the pigmentation and the absence of diarrhœa are to be noted. The sub-normal temperature is very common, while a widespread and withal healed or quiescent tuberculosis is also quite frequently found. In another autopsy report, after making a careful postmortem examination, McCrae remarked upon the fact that there was no evidence of tuberculosis beyond that found in the adrenal body, since the source of the pigmentation and the cause of adynamia in Adamson's disease are still subjects not yet decided, we may continue to be contemplative and inquisitive observers of these remarkable phenomena.

The treatment of a few of our cases with comparatively large doses of suprarenal gland as well as with adrenalin chloride hypodermically, has been followed by no encouragement whatever, not even by a temporary relief of weakness.

Another glimpse in this fascinating field of study is afforded by two cases of Diabetes Insipidus.

A clergyman, aged 46, with the usual complaints of thirst and polyuria, had been in health until nine months before admission, when, without overwork or worry or headache, he developed the condition for which he sought advice.

While in the hospital the urine was greatly increased, reaching as high as 128 to 130 ounces in 24 hours. The total output had been much higher before admission. Radiograms of the skull were negative. The blood showed no accumulation of non-protein nitrogen. The patient had already been treated by pituitrin with much, though temporary relief. One c.c. of pituitrin, posterior lobe, taken in the forenoon, would enable him to carry through the Sunday morning service, while the same dose late in the afternoon made it possible for him to preach comfortably in the evening.

This patient was advised to continue the use of pituitrin, to take sparingly of protein diet, to seek relief from his parochial duties, and to report later. So far no report has been received.

The second case came under observation in October 1916, a girl, 8 years. Her complaints were of thirst, loss of weight and frequency of urination. Apart from the ordinary infections of childhood and an injury to her right shoulder at the age of 7, there seemed to be nothing of interest to report in her past history. She was one of three children; whose parents were of average health and intelligence. She showed the typical character of urine of a case of diabetes insipidus; the daily output of urine amounting to upwards of 4000 c.c. At one time a trace of albumin was discovered. The phenolphthalein test gave an unusually high index, 96 per cent. The fundi were normal. The heart was irregular due to sinus arrhythmia. After a few weeks in the hospital she was discharged "unimproved." She returned in January 1919, with the statement made by her mother that she had been about the same as when she was in the ward until three months before admission when frontal headaches began. Vomiting at intervals began after a period of six weeks or so. There was a doubtful history of visual disturbances which was never comfirmed. She seemed to be somewhat retarded in her development and showed in her general state considerable drowsiness and undue irritability.

On account of the new phase which this case recently took on, a systematic attempt was made to explain the patient's complaints. The eye-grounds were frequently examined, but were always found normal. The blood of the mother as well as the father was negative to Wasserman tests. The history of the father included a luetic infection 20 years before, with two years of mercurial treatment. The patient's blood gave a negative Wassermann test. The cerebrospinal fluid, although it showed a reduction in the luetic zone with the colloidal gold test and a cell count of 77, was also negative as to Wassermann test. Radiograms of the skull indicated an early closure of the sutures with rather long and perpendicular posterior clinoid processes. Headaches, drowsiness, hunger, thirst, an unstable nervous state, "hysterical" attacks, irrational, delirious, unconscious, epileptiform seizures, periods of mental brightness and interestedness, occasional vomiting, describe her condition over a long period. Increasing weakness, slowness and irregularity of the pulse, subnormal temperature, left-sided ptosis, twitching of the right leg and arm, stupor, and coma preceded death on July 20, 1920, nearly four years after she was first admitted.

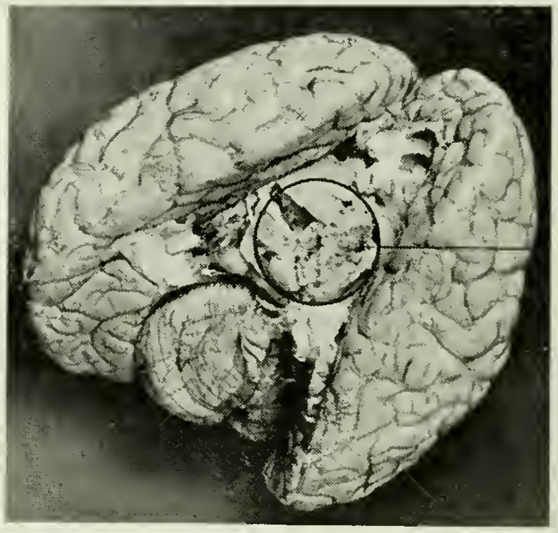
The case was regarded as that of typical diabetes insipidus. There seems no reason, even in the light of the autopsy to change one's mind, for there appears but little reason to regard as other than cases of diabetes insipidus, those cases in which an organic lesion is discovered. The response to pituitrin was identical with that recorded frequently elsewhere. The anterior lobe was tried by the mouth for a period of three days. Then the whole gland was given in the same manner. No change was observed at any time in the urinary output. The chart exhibited shows the intake and output for three periods. For the first period no pituitrin is administered; then for a period of three days, one-half c.c. of pituitrin, posterior lobe and pars intermedia, was given at 9 a.m. daily, and was followed by a corresponding period during which no remedy was used. The response was striking, reducing the urine from 3,000 c.c. before to 450 c.c. during the administration. Thirst was controlled, the output was lessened and concentration of the urine was greatly increased.

The cause of diabetes insipidus has been variously explained. At one time it was thought to lie in the kidney (Taliquist and Meyer). Then the pituitary body and later the posterior lobe have been held in some way responsible for the excessive outflow. Maranon (Endo. Voc. 5) strongly advocates the view that diabetes insipidus is a hypo-pituitary syndrome, urging the *frequency of lesions* of the posterior lobe; a tumor of the pituitary pressing upon the brain in the neighbourhood, was not found as often as a sclerosis, an atrophy, or an hæmorrhage. To this he adds with equal earnestness the fact of the favourable result of hypophyseal opotherapy as a conclusive point in the argument, comparing its action with that of thyroidin in myxœdema, and regarding this action as equally significant.

Through experimental work, prompted no doubt, by clinical observations and pathological specimens, another view point of the cause of polyuria, or diabetes insipidus is urgently demanding consideration. Important contributions to this subject from the experimental side have been made by several workers. The articles by Camus and Roussy—Endocrinology, Dec. 1920, and by Houssay, 1918—are particularly interesting. This work was done in greater part before the war. After operating on dogs, and noting the results, these workers conclude (a) it is neither the injury to, nor removal of the pituitary body which leads to polyuria in the dog, but rather a superficial lesion at the base of the brain. Total removal of the pituitary body without injury to the base of the brain does not cause polyuria. A superficial lesion at the base of the brain seems enough to produce polyuria in the animal operated on. The opto-peduncular region is that within which injury is followed by polyuria. It lies at the level of the grey substance of the tubercinereum in the vicinity of the infundibulum. One such experiment induced polyuria for seven months. It appears also from this article, that the polyuria is produced independently of the thirst.

Now, in regard to the post-mortem findings in the patient whose case is outlined above, the report states that at the base of the brain a mass projects to occupy the place of all the structures in the situation of the Circle of Willis. The tumour obscures the Circle of Willis and also displaces the optic chiasm and the second, third and fourth nerves. Attached to it, yet independent of it, is a large pituitary. The corpus striatum and the optic-thalamus were pushed to one side. The situation of the tumour showed that it undoubtedly involved that zone, the injury of which produces polyuria.

Histologically, the anterior portion of the pituitary is involved with new cell growth. When one reviews the clinical history of the patient, there seems to have been a long period of polyuria before the development of any signs which one could ascribe to intracranial tumour. Symptoms of diabetes insipidus were marked in 1916. Late in 1918 the headache was first complained of. On microscopic examination *only* were signs of tissue change discovered in the pituitary, while the tumour itself, from the description above, is seen to be of considerable size.



See Circle on cut

The interest in such cases deepens with more clinical and experimental evidence, which one must admit is not all in favor of the view that diabetes insipidus is a hypophyseal syndrome.

INTRODUCTORY REMARKS

F. C. Neal

Peterborough, Ont.

THE programme for this afternoon is somewhat of an innovation; and I have been chosen, as one of the members of the Ontario Laennec Society, to explain to you what this Society stands for, and our reasons for arranging the programme as you find it.

This Society was organized several years ago, for the more scientific study of tuberculosis, by a group of men devoting all, or a greater part of their time, to this work. Three meetings have been held each year, the different institutions throughout the Province have been visited, and much interest has been maintained in the work. Among other things accomplished, has been the drawing up of a system of Diagnostic Standards of Tuberculosis, which we hope to have published some time in the future.

When we received an invitation from the Ontario Medical Association to take part in the program, it was only after careful consideration, that our contribution as outlined, was decided upon.

Instead of dealing with some complex phase of the subject, we have chosen something more common and simple, and yet extremely important, viz. "The Essentials of present day knowledge of diagnosis of Pulmonary Tuberculosis." Not that we have anything new or spectacular to offer, but we feel that the profession as a whole, is not using to the best advantage, the

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Being part of a symposium on tuberculosis (other papers will appear in next issue).

means of diagnosis already at its disposal.

In order to cover the field as completely as possible, and to present only the essential points, the society was divided into committees, each choosing a convenor, who will read the paper as prepared by his committee.

The papers have been arranged as far as possible in the order of their importance in diagnosis, a carefully taken history of the patient coming first, followed by a record of his constitutional symptoms. We cannot too strongly emphasize the point, that these steps are more important than the physical examination.

In the paper on "Physical Signs," you will be reminded that the proper preparation of patient for examination, is a "sine qua non," and that inspection, and percussion are as important as auscultation, which should be the last phase in the physical examination, and not the first, as is a common practice.

Coming to the use of X-ray as an aid in diagnosis, the clinician should remember that it is merely an aid, not a short cut replacing physical examination.

The X-ray plates, especially the stereoscopic, are of great assistance in many cases; but there are so many technicalities involvd in the process of taking plates, and so many chances of error in reading them, that in order to be of most value, the work in both respects, should be done only by those well acquainted with the technique.

In regard to specific tests, I would in passing, call attention to the importance given to repeated and careful sputum examinations.

As you will see indicated in the paper on "Differential Diagnosis," a wide knowledge of clinical medicine is required; and what the late Sir Wm. Osler stated in regard to syphilis, viz. "Know syphilis in all its manifestations and relations, and all other things clinical will be added unto you," might with a good deal of truth be stated of tuberculosis.

It will thus be seen, that a correct diagnosis can only be arrived at, by a careful summing up of the facts gained by all the different steps outlined; and no one has a better opportunity of detecting early symptoms and signs, than the family physician.

However, in the fight against tuberculosis, the general practitioner must not only be able to detect early morbidity and thus reduce mortality, but he must be active in the greatest field of all—the field of prevention.

To make real progress, we must get the truth about tuberculosis to the people; we must get them educated to the fact that the two common sources of infection are:— human sputum and cows' milk. We must get them to realize that infection is almost universal, and that whether the infection becomes disease or not, depends upon environment—the younger the child the greater the probability of infection becoming disease. We must impress upon the public that the contributory factors to tuberculosis morbidity include anything and everything that adversely influences the health of man.

This forces us to the conclusion that the proper place to begin preventive work is with the child. The slogan should be "Prevent contact in childhood."

We will get a grip on tuberculosis, when we create a universal and correct public sentiment concerning it, then and no sooner. The general practitioner can aid in this greatly, by educating his own patients, and by aiding all movements intended to improve hygienic conditions in his community. In my opinion the medical profession should be in a position to lead and direct the work of voluntary societies interested in public health, thus conserving energy and imparting correct information.

In conclusion we trust that the different papers, given this afternoon, may be of value in helping to sift the essential from the non-essential, that through them, your interest in the study and prevention of tuberculosis may be renewed and strengthened, and that your ability to detect really early cases of this disease will be enhanced. If we succeed in this, we will feel fully repaid for our labors.

HISTORY IN TUBERCULOSIS

H. C. Parsons, M.A., M.D., M.R.C.P.

Toronto

By this is meant the significance of the history both family and personal, in a case of tuberculosis. The history of the present attack is so closely bound up with the symptoms, that only one or two points will be mentioned, as the others will be taken up in another section.

Family History

Tuberculosis is essentially a family disease, and as such, has a vital interest in the record of the antecedents, of the family life and surroundings, and of the ills of each member of the household. I use the expression "household" advisedly, for not only the family, but each member of the household is concerned.

In the family history there are three points for consideration:

I. Heredity. (a) Transmission of the infection.
   (b) Transmission of a pre-disposition to the disease.

II. Infection by contact with, and exposure to, an infective case in the household.

Transmission of the Infection

Congenital tuberculosis is an established fact, but it is rare. Of all the cases reported in literature, Huss accepts as reliable, 40 in man and 100 in cattle, Warthin and Cowie accept only 5 in man as indisputable: such children die shortly after birth. There are, however, certain cases in which tubercle bacilli have been found in the placenta and in the foetal blood without pathological lesions in the organs of the child. One is reported by Birsch-Hirschfield and Schmorl, a case of Caesarian section on a woman who had died of miliary tuberculosis. The child was also dead. Tubercle bacilli were found both in the placenta and in the foetal blood. Bugge reports a similar instance—a woman forty years of age who died of tuberculosis four hours post partum, the child died twenty-six hours after birth. Tubercle bacilli were found in the blood of the umbilical and hepatic vessel, proved by animal inoculation. No tuberculous lesions were found in the child's body.

Such cases suggest that it may be possible that Baumgarten's theory stands, that such infection can occur in utero and remain latent for years and then take on an active process in the body.

Transmission of a Pre-disposition to Disease

There is a well-grounded belief that such exists; it is a time honored theory. It was supported by Koch, and Baumgarten on the other hand disregards it.

A tuberculous mother may give birth to a puny and ill-nourished child. She may, on the other hand, give birth to a perfectly healthy child, and that child, removed from its mother immediately after birth, may show no evidences of tuberculosis. We have had cases of this kind in our experience. Parents debilitated by wasting diseases other than tuberculosis are just as liable to bring forth children of an ill nourished type. Add to that, poverty and unsanitary surroundings, and we have a case equally as bad as the tuberculosis situation.

In a study of 1000 families, J. E .Squire has noted that the families with tuberculosis parentage showed only 10% tuberculosis in the children, in excess of those with non-tuberculous parentage. This 10% small margin can readily be accounted for by infection after birth. Sutherland has shown that children of open cases of tuberculosis are much more frequently infected than those of closed cases. It has certainly been our experience in the survey of some 4,500 children, tuberculosis contacts, that those infected, as shown by a positive tuberculin test, were not necessarily ill-nourished or below par—in many cases it was strikingly the opposite.

It is obviously difficult to draw a definite line

Being part of a symposium on tuberculosis (other papers will appear in next issue).

between the points of family pre-disposition and post natal infection in a household where a child is born of parents with active tuberculosis, for the moment the child is born, it at once becomes exposed to infection, and this exposure is taking place at the most susceptible time of its life.

There is a wealth of discussion in literature upon this much debated point of family pre-disposition. Schlossmann concludes his section on this subject as follows:- "To what extent we are dealing with tuberculous manifestations in these children, we cannot at present say." "There is no satisfactory definition, nor is there a satisfactory proof of a specific pre-disposition." (Baldwin)

INFECTION BY CONTACT

In the close relations which exist between the different members of the family, and in squalid surroundings, exposure to an open case of tuberculosis must be considered the most important point in the family history of a case. It is admitted that such exposure is much more dangerous to a child than to an adult, we cannot however underestimate the menace to the latter but a child has the double chance of infection by the air, and infection also by the alimentary canal, from the careless habits of the mother, the habit of putting things in its mouth, and of playing on the floor.

In taking the history of such a case it is not sufficient to find that the members of the family are well at the present time, but has there in any of them been an illness referable to the respiratory tract. I have repeatedly found children with tuberculosis, and have received a good family history, but on examining the parents have found an old lesion in the chest, and have later elicited a history of their having passed through one or more acute attacks. As an example:- A woman 45 years of age with five children. I examined these children and the three youngest had mediastinal tuberculosis and were positive to tuberculin. On examining the mother I found a well marked fibrosis of the apex of the right lung. On questioning her she gave a history of having had a cough, sputum and pulmonary haemorrhage while carrying the third child. After delivery this cleared up. While pregnant with the fourth child she had the same thing occur, activity in the right apex with haemorrhages, and the same was repeated with the fifth child. Again. With a history of tuberculosis in the family, was the patient under examination ever exposed? That is the important point. Again. With a clear family history was there anyone else in the house with lung trouble, such as a lodger or frequent visitor, or a nurse maid. We have had a number of cases of this kind brought to our notice and that is why I emphasize the *household* as well as the family.

Family conditions also require investigation, and in our Clinic work we seek this information by means of the reports of the visiting nurses as to the home conditions, the disposal of sputum, ventilation, over-crowding, and the protection of food, and in the most unexpected way we sometimes find the source of infection. As an example:- Recently in a boy of six years of age I found tuberculosis of the mediastinal glands. The tuberculin *test was positive,* and *an X-ray* confirmed the findings. The family history was apparently good, and the parents could give no history of the child being exposed to tuberculosis at any time. It was discovered, however that at the time of the child's birth the family were living in a house with an open case of tuberculosis, and continued to do so for six months after the birth of the child. It was one of the Public Health visiting nurses who disclosed this fact, a striking tribute to the value of the visiting nurse in clearing up some of the problems we encounter in this work.

CONCLUSIONS

(1) Congenital tuberculosis is possible, but it is rare.

(2) Inherited pre-disposition—of this there is no satisfactory proof.

(3) Post natal infection is all important.

PERSONAL HISTORY

In the personal history there are several points of importance, and the main ones that we will refer to are:-

(1) Haemoptysis
(2) Pleurisy
(3) Unexplained Fever
(4) Cervical Adenitis
(5) Repeated Cough and Sputum
(6) Ischiorectal Abscess

1—*Haemoptysis.* I refer to a frank haemorrhage of one to two drams. This will be followed by blood-streaked sputum or small clots becoming darker in color.

In the great majority of cases we rely upon the patient's statement, and owing to fallacies that may arise, it is well to investigate. The physical examination of the patient will reveal these fallacies, such as possibly a cardiac origin, or some lesion in the mouth or naso-pharynx.

Fron sixty to eighty per cent. of all cases of pulmonary tuberculosis have haemoptysis.

Tuberculosis is the cause of haemoptysis in from eighty-five to ninety per cent. of cases.

It is a well-known fact, as Osler said, that it may be months after a haemorrhage before the symptoms of pulmonary disease become established. Hence the importance of the history.

2—*Pleurisy.* In the so-called primary or idiopathic pleurisies, Eichorst has demonstrated tubercle bacilli in the exudate in 62% of the cases. The interesting point is the subsequent history of such cases and the number of them that develop tuberculosis of the lungs. In a series of 562 cases, Hamman found that 29.7% eventually developed tuberculosis. In another group there were 30%, and in a series reported by Hedges 40%. If this be the case we must assume that an attack of pleurisy is of vital import in the patient's history. Pleurisy of the dry, fibrinous or serofibrinous type usually ends in recovery. In a number of cases the symptoms are so slight as to have been hardly recognized by the patient or physician, but it often leaves well marked signs, such as a thickened pleura, which may be discovered months or years later and this may assist in sizing up a case of tuberculosis, even though no history of it has been given.

3—*Unexplained Fever.* Tuberculosis is the most common cause of unexplained fever. This does not only apply to children, but also to adults.

The history of fever where the "doctor cannot find out the cause," is quite common and is also significant.

A case in point: A female, 35 years of age. During her childhood she had frequent attacks of fever for which no cause could be assigned. At 21 years of age she entered King's College Hospital, London, to take her training as a nurse. After four months of work she was taken ill; she had fever for one month. Her case was never diagnosed, although every available means was employed. Later on she entered St. Thomas Hospital, and after a few weeks' work, she was laid up for 10½ weeks with fever as before. Here again the diagnosis was in question. She came to Canada 7 years ago. She would have short attacks of fever, three or four in a year, lasting a few days to two weeks. I saw her in one of these in July 1919. It is one of the few cases of mediastinal tuberculosis that I have seen in an adult. The glandular cases are more prone to give rise to this fever in my experience.

In childhood a history of recurring fever and vomiting with no evident cause is a common picture in mediastinal tuberculosis.

4—*Cervical Adenitis* As evidenced by a glandular mass or scars in the neck is worthy of note. These scars may have been other than the result of tuberculosis, it is true, but the irregular distorted, disfiguring cicatrics suggesting long suppuration, are significant. This infection may precede pulmonary tuberculosis by months or years, and is of special interest because of the latency of the pulmonary lesion.

5—*Ischiorectal Abscess* occurs in 3.5% of pulmonary tuberculosis.

The lesion itself has been repeatedly demonstrated to be tuberculosis.

It may precede the symptoms of pulmonary disease by years.

When tuberculosis it is rarely primary, hence its importance in the history of pulmonary tuberculosis.

6—*Coughs and Colds* Repeated coughs, attended with sputum, or a tendency to catch cold readily, are important.

Pulmonary tuberculosis is notably a disease of remissions and exacerbations of symptoms and of signs, as anyone will agree who has watched a chronic case over a period of years.

It is possible that these exacerbations are a reactivation of the disease per se following over-exertion or such like, or it may be an activation brought about by some cross infections. Be that as it may, such history is all important in any case of tuberculosis.

A history of loss of weight, or fatigue, is usually part of the history of the present attack, yet in the patient's past loss of weight associated with any pulmonary condition or possibly without it, is a point well worth noting.

In the same way a history of undue fatigue, not only recent, but lasting for some considerable time, is an important point in the history of any case of tuberculosis.

TOXIC GOITRE

THE EFFECT OF THYROIDECTOMY ON THE BASAL RATE, THE PULSE RATE, AND THE GENERAL NUTRITION*

E. M. Eberts

Surgeon to the Montreal General Hospital

It will probably be some time before we achieve a classification of the diseases of the thyroid gland acceptable alike to the clinician and the pathologist. We have here, however, to deal with only two types of goitre, both associated with hyperthyroidism; namely, hyperplastic goitre (Graves' disease, exophthalmic goitre) and toxic adenoma (foetal adenoma, discrete nodular adenoma). Now, while the former disease is readily recognized after exophthalmos has developed, there may be delay in differentiating between hyperplastic goitre without ocular signs and toxic adenoma. Because of this, I may be forgiven if I venture to repeat once more the cardinal points in the differentiation of the two conditions.

Graves' Disease	Toxic Adenoma
The disease may occur at any age; most commonly between 20 and 40. Symptoms develop within three months of the appearance of the goitre. Not infrequently they are present for weeks or months before the enlargement of the thyroid is discovered.	Enlargement of the thyroid usually makes its appearance between the ages of 20 and 30. The toxic symptoms develop from 7 to 30 years later; average 16 years.
Goitre: Uniform hyperplasia, involving both lobes and the isthmus, over which there is marked pulsation, a distinct bruit, and frequently a thrill.	Goitre varies in size from small discrete single or multiple nodules, unilateral or bilateral, to large cystic type generally described as "simple goitre." Consistence varies from the fluctuating cyst to the calcified mass. Pulsation in neck is frequently absent, and there is neither thrill nor bruit.
The size of the goitre bears no relation to the severity of the toxaemia. In the severest cases there may be very slight visible enlargement.	In large goitres, because of pressure upon the trachea or recurrent laryngeal nerve, there may develop huskiness of the voice; aphonia; frequent hacking cough; dyspnoea or cyanosis upon exertion or when lying down.
Symptoms develop rapidly and generally become so severe as to incapacitate the patient within three to six months.	Symptoms are slow in developing, leading to incapacity in from one to three years.
Tremor of the hands, rapidly increasing in severity. Later possibly tremor of the whole body.	Tremor of the hands, definite but not violent.
Marked nervousness, restlessness, mental irritability, and not infrequently delirium.	Nervousness, restlessness, and irritability mild in comparison. No delirium.
Rapid loss of weight.	Gradual loss of weight.
Rapid loss of strength.	Gradual loss of strength.
Insatiable appetite.	Appetite capricious. Not usually increased; frequently diminished.
Profuse sweatings.	Skin moist, but sweatings infrequent.
Heat intolerance.	Slight or no heat intolerance.
Ocular signs: Exophthalmos appearing usually within three months from onset of symptoms. May be pronounced within six months. In 90 per cent. of all cases appears within two years. Other ocular signs—Graefe, Stellwag, Moebius and Joffroy.	Exophthalmos and other ocular signs are conspicuous by their absence.
Heart: tachycardia. Pulse range from 120 to 140, or higher.	Tachycardia. Pulse range from 90 to 120. There is usually severe nocturnal praecordial thumping.
Blood pressure normal or subnormal.	Blood pressure usually increased.
Basal metabolic rate plus 40 to plus 80.	Basal metabolic rate plus 20 to plus 40.

The following case reports, with their accompanying charts, illustrate the effect of thyroidectomy on the basal rate, the pulse rate, and the general nutrition.

Case I.—Hyperplastic Goitre

H. L. S. No. 3112-21, watchmaker, was admitted on June 3, 1921, to the service of Dr. Finley, in a crisis of hyperthyroidism, presenting all the cardinal symptoms of Graves' disease. On the night of admission he was irrational, and for a time violent. The temperature was 99; the pulse, 160.

The symptoms of hyperthyroidism dated from June, 1920. Enlargement of the neck was first detected in December, 1920. There was marked tremor of the lips and hands; nervousness; restlessness; mental irritability; loss of strength; marked quadriceps weakness; heat intolerance; vomiting; and diarrhoea. There had been a loss of 52 lbs. in weight in the preceding six months. The skin was moist, but sweating had not occurred. The urine was acid, specific gravity 1.012, and contained albumin and a few casts. The differential blood count showed polymorphonuclears 59 per cent; small lymphocytes 25 per cent; large lymphocytes 12 per cent; and transitionals 4 per cent. The thyroid was large, with uniform hyperplasia of both lobes and isthmus. There was marked pulsation in the neck, with a palpable thrill and loud bruit over the thyroid. Exophthalmos was pronounced. Graefe, Stellwag and Moebius signs were present. The transverse cardiac dulness was 11 c.m. There were no murmurs. The blood pressure was 88 diastolic, 102 systolic (a dangerously low pulse pressure). On the day after admission the basal metabolic rate was estimated to be plus 80. The weight was 66 lbs. (Normal weight - 118 lbs.)

Ice bags were applied to the neck and praecordia. Compound chalk powder was given to control the diarrhoea, and minims 3 of Tr. Belladonna was given every eight hours. At the end of two weeks (June 19) the basal rate had fallen to 58, and the pulse to 108; and from this time on the case presented a much more favourable aspect, the rate steadily declining until on July 12 it was plus 37, the pulse 96.

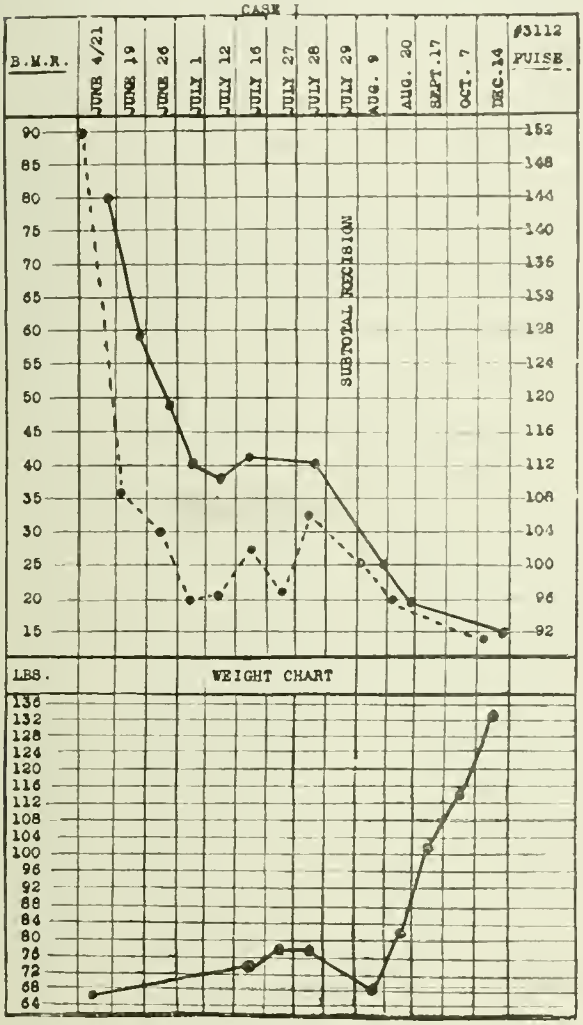
On July 14 the case was transferred to my service. At this time excellent cerebral control had been established and all other symptoms had abated. The diarrhoea, though of a more moderate grade, still persisted (four stools daily). Although the appetite could not be appeased during the 25 days preceding his transfer, the patient's weight had remained stationary at 75 lbs. Throughout the fastigium of the attack the urine was generally of low specific gravity (1.012-1.014, and contained albumin and at times numerous tubular casts. While the basal rate had now reached a level at which operation might be considered safe, it was felt that, even in the absence of physical signs, the heart muscle must have suffered severely during the period of acute intoxication. Then, too, the patient had, in spite of a liberal diet, failed to show the expected gain in weight. For these reasons and in the hope of improving the nutrition of the heart muscle, operation was postponed for a further period of two weeks, or until July 29, at which time all signs and symptoms appeared to favour the undertaking.

Under local anaesthesia subtotal thyroidectomy was performed. Apart from a very rapid pulse rate (180-200) throughout the day following operation, there was very little reaction. The usual post-operative nervous phenomena were entirely absent, this feature being the more remarkable because of the serious involvement of the central nervous system at the time of admission.

Convalescence was uninterrupted. The patient was discharged on August 25th.

Comment. During the fastigium of the attack (June 3-15) the urine had contained variable amounts of albumin, the specific gravity remaining constant at 1.012-1.014. From June 15 until the date of operation, July 29, the urine was free from albumin, but the specific gravity remained the same. Immediately following operation albumin reappeared, without any change in the specific gravity, and this condition persisted until August 22, when practically all proteins were withdrawn from the diet, with the result that within five days the specific gravity had risen to 1.022 and there was no further trace of albumin. Casts which had also been present from time to time, now finally disappeared. With this improvement in the renal function there was a rapid gain in weight, as will be seen by the accompanying chart. The patient has more than doubled his weight since operation, and is from 12 to 14 lbs. above his previous maximum weight.

This case furnished the first clue to the possibility of controlling or lessening the hyperthyroidism by eliminating, as far as practicable, proteins from the dietary. As the thyroxin molecule is a protein, it is reasonable to suppose that its elaboration may be directly affected by the protein intake.



Case II.—Hyperplastic Goitre Without Ocular Signs

Miss V. C., No. 2282-21, aged 20, stenographer, was transferred from Dr. Gordon's service on May 21, 1921, suffering from Graves' disease of a mild type.

The patient had influenza in February 1920, followed shortly after by palpitation and a feeling of nervousness. There was progressive loss of weight. The enlargement of the neck was first detected in May, 1920, when application was made for life insurance. The month of July, 1920, was spent at rest, and during this period there was a gain in weight, with general improvement in health. In January, 1921, there was a recurrence of the palpitation, nervousness, and loss of weight, with occasional vomiting.

On examination there was found tremor of the hands, with marked nervousness. There had been a loss of 20 lbs. during the previous six months, and also loss of strength. The appetite was very much increased. There was marked heat intolerance. The skin was moist, with frequent sweatings and flushings. The tonsils were submerged and cryptic. The urine was normal. R. B. C. - 5,120,000. Leucocytes - 11,400. Haemoglobin 80 per cent. There was uniform enlargement of the thyroid gland, with marked pulsation, thrill, and bruit. There were no ocular signs. X-ray of the upper thorax revealed no evidence of enlarged thymus. Heart: tachycardia; praecordial thumping. Transverse cardiac dulness 8 cm. Basal systolic murmur. Pulse range 96-110. Blood pressure 60-120. The electro-cardiogram showed a tendency to left ventricular preponderance.

On May 28 the basal metabolic rate was plus 26.

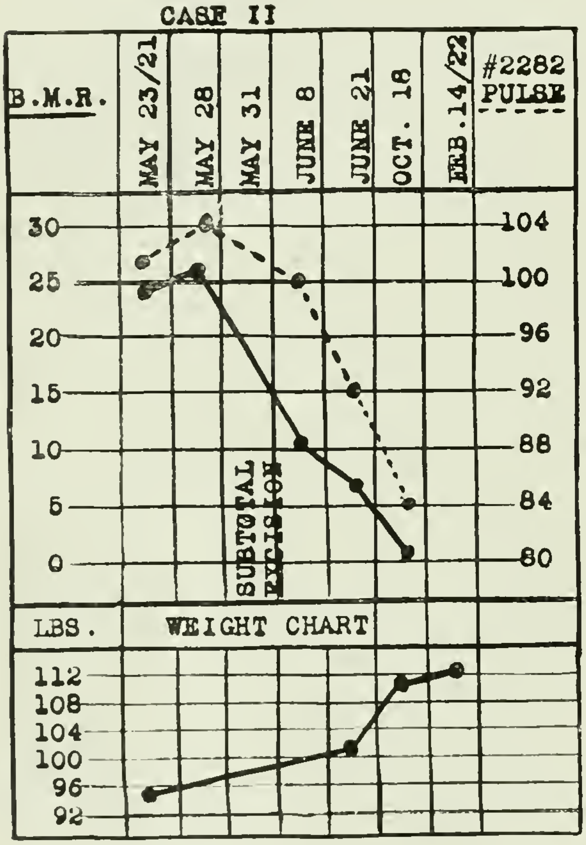
On May 31, after ten days preliminary rest in bed, subtotal thyroidectomy was performed under local anaesthesia. The diagnosis of hyperplastic thyroid was confirmed by microscopical examination.

The wound healed per primam and the patient was discharged on June 21. The basal metabolic rate at that time was plus 7; pulse range 80 - 96. There had been a gain of 6½ lbs. in weight, from 95 lbs. to 101½ lbs.

On October 18 the basal rate was found to be plus 1; the weight 111¼ lbs.

Under date of January 1, 1922, the patient wrote: "My pulse is quite normal. I have had not the slightest trace of palpitation since my return from Montreal in October. There is no sign of tremor. My nerves are steadier than they have been for the last two years. My appetite is not as large as it was, but I should say it is quite healthy."

Comment. This case is quoted against the preceding one as an example of the result which may be anticipated where operation is undertaken before toxic saturation has occurred. Another lesson to be learned from this case is that, although the symptoms were relatively mild, the electro-cardiogram showed beginning myocardial changes. Indeed one feels that myocardial changes depend rather more upon chronicity than upon the initial severity of the toxaemia. This suggestion is supported by the more frequent occurrence of myocardial changes in cases of toxic adenoma, where, as we shall see, the symptoms more closely resemble those found in this case. A further analogy between this case and the toxic adenoma type is the absence of ocular signs.



Case III.—Toxic Adenoma

Mrs. A. D., No. 2960-21, aged 59, referred by Dr. Blackader, was admitted June 27, 1921.

Personal History—At the age of 34 the patient was treated for a mild pulmonary infection, from which she made a good recovery. In 1912 the patient suffered a "nervous breakdown," with loss of weight, and was in hospital for three weeks. Subsequently she was in fair health until 1915, when there developed retrosternal pain, passing upward from the xiphoid and radiating down the left arm. This was accompanied by palpitation and nervousness. Again the patient was confined to bed for one month. Fair health was maintained until February, 1920, from which time the present illness is dated.

In February, 1920, there developed palpitation, praecordial thumping, and retrosternal pain, accompanied by loss of weight. In October, 1920, The patient first noticed tremor of the hands. In February, 1921, six teeth were extracted for pyorrhoea, but without relief of the symptoms. Early in 1921, too, an attack of diarrhoea, lasting several weeks, caused grave anxiety. It was only after wasting had become pronounced that increase in size and irregularity in contour of the left lobe of the thyroid were discovered. On June 1 the basal metabolic rate was found to be plus 24.

On admission to hospital the patient complained of weakness, loss of weight, praecordial pain, and palpitation. In addition to these complaints the case presented the following clinical features: tremor of the hands, nervousness, mental irritability, severe insomnia, loss of strength, quadriceps weakness, very meagre and capricious appetite, and frequent nausea. The skin was moist, with flushings and fugitive erythema. Examination of the neck, with the head in extension, showed visible, though very slight, fulness in the position of the left lobe of the thyroid. On palpation there appeared to be a distinct irregularity in the surface of this lobe. There was no visible pulsation in the neck, and there was neither thrill nor bruit over the thyroid. There were no ocular signs. The transverse cardiac dulness was 11 cm. Pulse average 116. Blood pressure 135 systolic, 80 diastolic. The electro-cardiogram showed a normal tracing. The basal rate was found to be plus 27. The most distressing symptoms were the praecordial pain, insomnia, anorexia, and progressive loss of weight, with gradually failing strength.

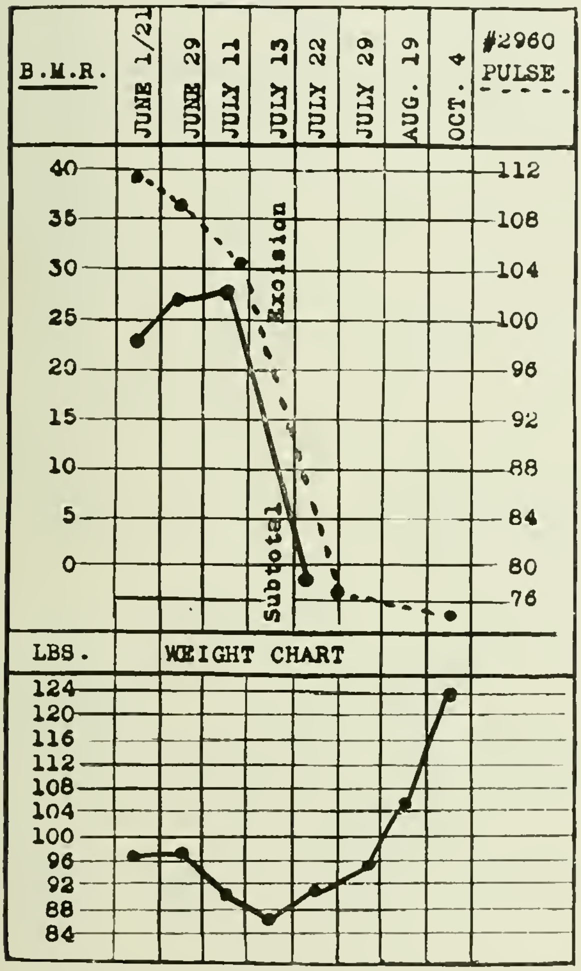
On July 10 the basal rate was plus 28.

On July 13, after the patient had been under observation in hospital for sixteen days, subtotal thyroidectomy was performed under local anaesthesia. Practically the whole of the left lobe, the isthmus, and the anterior half of the right lobe, were removed. The left lobe was found to be the chief seat of trouble, and in it were found several definitely encapsulated adenomata.

Convalescence was uneventful. The praecordial pain and thumping disappeared within 24 hours after operation. The tremor of the hands had subsided by the tenth day. There was an immediate resuscitation of the appetite, which became vigorous and constant. On the day of discharge, ten days after operation, the basal rate was found to be minus four-fifths per cent; the pulse average 76.

On October 4 the patient was seen again. There were no residual symptoms. The weight was 123½ lbs., as compared with the pre-operative weight of 91 lbs. The patient was considered well enough to undertake without risk a sea voyage to Europe.

CASE III



Comment! The outstanding features of this case were those suggested by the complaints, namely, praecordial pain and palpitation, anorexia, asthenia, and insomnia. The enlargement of the thyroid was for a long time not discernible. I have been unable to find in the literature any reference to the occurrence of severe anginal pain radiating to the arm in association with thyroid disease, where electrocardiographic or other evidence of organic changes in the heart muscle or its enervation was lacking. This patient illustrates again the possibility of an obscure and intractable diarrhoea being due to an unobtrusive lesion of the thyroid gland. (1)

Case IV.—Toxic Adenoma

Mrs. M., No. 2833-21, aged 60, housekeeper, referred by Dr. Rodgers, of Cowansville, was admitted July 4, 1921, complaining of swelling of the neck, shortness of breath, and pounding of the heart.

There had been enlargement of the neck for eight years, but the toxic symptoms did not develop until after an attack of influenza in March 1921. The patient found it increasingly difficult to perform her duties, because of nervousness and palpitation. There was also tremor of the hands, and insomnia had been a troublesome feature for three weeks prior to admission. The appetite was normal.

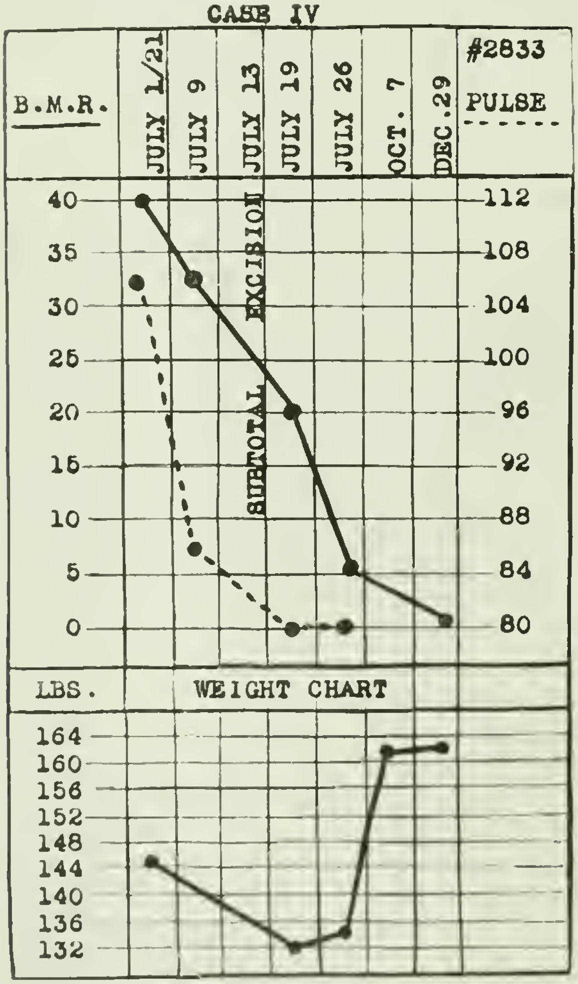
On admission the goitre was found to be large, spherical in outline, very firm, involving the left lobe of the thyroid, with displacement of the trachea to the right. The goitre was of the plunging type, rising during deglutition and then largely disappearing behind the left sterno-clavicular articulation. There was neither thrill nor bruit over the tumour. Ocular signs were absent. In addition to the palpitation and praecordial thumping complained of, the transverse cardiac dulness was found to be 11 cm. from midsternum. There was a blowing systolic murmur at the apex, with occasional arrhythmia. The pulse was 102, regular, full. The radials were slightly thickened, but not tortuous. The blood pressure was systolic 140, diastolic 90. The electro-cardiogram was negative. The basal metabolic rate, taken on July 1, prior to admission, was plus 40. On July 9, after five days rest in bed, the second estimation showed it to be plus 33.

On July 13, under local anaesthesia, the whole of the left lobe and the isthmus were removed, together with a small portion of the anterior part of the right lobe. The patient made an uneventful recovery, and was discharged on July 29, the basal rate then being plus 6.

Comment. It is interesting to note the development of toxic symptoms upon the heels of an acute infection (influenza).

It is now well recognized that in from 20 to

25 per cent. of all cystic adenomata, toxic symptoms eventually develop. The foregoing case is an example of this type of adenoma. While the clinical manifestations are precisely similar to those met with in Case III. the gross pathology of the thyroid lesion is widely different. While in Case IV one had to deal with an adenoma consisting of numerous cysts of varying sizes and in different stages of degeneration, Case III represents the type of adenoma in which the lesion or lesions is circumscribed, encapsulated, and microscopically presents the characteristic features of normal thyroid tissue. Were it not for the limiting capsule, such an adenoma would not be discoverable, as the histological feature of hyperplasia is not met with.



Summary

The four charts reflect accurately our invariable experience in fifty consecutive cases of the effect of thyroidectomy upon the basal rate, the pulse rate, and the general nutrition. In no case has the procedure failed to eliminate hyperthyroidism, reduce the pulse rate to normal limits, and restore body weight. To secure this uniformity in results, it is essential that all hyperplastic cases should remain at rest for three months after operation. To maintain these results, a much longer period may be essential in those cases where the initial toxaemia has been severe and accompanied by profound nutritional disturbances (as in Case 1), or where the intoxication, though comparatively mild, has persisted for several years.

Permanency in results in hyperplastic goitre is dependent, apart from post-operative rest as mentioned above, upon the performance of a radical operation. Approximately three-fourths to four-fifths of the total bulk of the gland should be removed. Where an insufficient amount of tissue from both lobes and isthmus is removed, hypertrophy of the residue may take place. Ligation and lobectomy should be considered as "stage" operations, and as having but temporary effect. They may be indicated in high rate cases as a means of bringing the rate within safe bounds, and also serve as tests of the patient's stability. With the broadening of experience and improvements in technique, however, "stage" operations in hyperplastic goitre are less frequently indicated.

Having the various clinical features accurately assessed in each case, the time chosen for operation is the most important single factor in the conduct of the case. As stated in a previous paper, (2), the best results are to be secured by early operation, before toxic saturation has been reached (Case II); that is, before exophthalmos is pronounced, before grave nutritional changes have developed (loss of weight and strength), and before the myocardium has been seriously damaged.

Of the residual symptoms, exophthalmos and myocarditis are the most pernicious.

The form of toxic adenoma illustrated by Case III would appear to be much more common that is generally supposed. The symptom group of rapid pulse, tremor of the hands, and loss of strength, should render the thyroid suspect, even in the absence of visible or palpable enlargement; and if, in addition, the basal metabolic rate is, on repeated estimations, persistently above plus 15, there can remain little doubt of the diagnosis. Many of these cases stumble through the period of thyroid intoxication to succumb eventually to myocardial disintegration.

That hyperthyroidism develops in from 20 to 25 per cent. of thyroid adenomata of the type illustrated by Case IV (the so-called simple goitre) is not generally appreciated. Rapid heart action and shortness of breath are ascribed to "pressure upon the windpipe." and operation is advised against because of the size of the tumour. It is true that pressure and hyperthyroidism frequently co-exist, but the size of the tumour has no bearing upon the surgical risk, which is practically nil, especially if thyroidectomy is performed under local anaesthesia.

In toxic adenoma a prompt cure is assured, if all foci of disease are removed before heart changes occur. Normal basal metabolic and pulse rates are usually recorded within ten to twelve days after operation.

The gain in weight in both types of toxic goitre is always phenomenal in rapidity and extent,—quite beyond the expectation of either the patient or the surgeon.

Clinical observations would suggest that a carbohydrate-fat dietary promotes nutritional repair more rapidly than a diet in which proteins are freely allowed, and that this may be explained on the basis that proteins favour the perpetuation of hyperthyroidism, by supplying the necessary elements for the synthesis of thyroxin. This theory, while at first applied in the treatment of convalescent patients, is now being tested as a means of lowering the basal metabolic rate before operation is undertaken.

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THE CANCER PROBLEM

HERBERT A. BRUCE, M.D., F.R.C.S. (ENG.)

Professor of Clinical Surgery, University of Toronto

THE cancer problem has been the subject of investigation for more than two thousand years and still remains a question of superlative importance which is engaging the attention of governments, societies, commissions and the greatest endeavors of the medical profession working together and singly in the hope of a solution.

Vast sums of money have been spent in the collection of facts and figures; in the furthering of research work; in the founding, equipping, staffing and maintaining of special hospitals and clinics where cases may be treated and studied; in the education of the people and workers on cancer. The result is that at present no less than fifteen fully equipped cancer hospitals are treating patients, twenty research laboratories are working continually, to say nothing of the innumerable individual laboratories in America and Europe; each university is contributing its quota; every pathological laboratory is making known facts and findings which assist in throwing light on the problem.

All these efforts have succeeded in collecting about the problem such an enormous mass of facts that, while a very great deal has been made clear, the problem has been more or less split into numerous entities for which there does not appear to be a common cause.

The advances have been mainly in the line of classification and in the establishing of the minute structure and behavior of the different forms; and these have occurred since the advent of the microscope. Prior to this the imagination was given full play in the supposed causation, the diagnosis, and the treatment of the disease. The name given to the disease, which was thought to resemble a crab, illustrates the state of mind of the early investigators. Even as late as the seventeenth century, cancer was thought to be caused by a spiritual being, the Archæus, resident in the stomach and spleen.

The powers of fantasy displayed by the ancients in the formulation of their theories of causation were only equaled by their ability to mystify the methods of treatment. The cancer patient was full partner in all these perpetrations, welcoming anything new and placing favor in the most weird. If he resided in England he was subjected to such mixtures as dog's fennel, crow's feet, sulphur and arsenic; and if he survived these he was qualified to consult the witch doctor, who initiated him into the black art and treated him to some witch's broth. If faith has ever cured cancer, surely it missed a grand opportunity in these manipulations of the occult science. If the sufferer lived in France he grew accustomed, on survival, to all the various ingredients of green frogs. In Germany he drank copiously of concoctions of suckling puppies; while in Africa he could be treated to nothing better than tortoise liver and cancer bush.

How all these treatments originated would occupy too much time in the telling, and would be as difficult to explain as it is impossible to know why some patients today forego an orthodox treatment and feed raw beefsteaks to open malignant tumors, which, they are observed to say, devour the steaks with avidity.

While mysticism seemed to reign in the sphere of treatment, we must observe that as early as A.D. 180 Leonides, of Alexandria, practiced excision of malignant growths by cutting through healthy tissues with the knife and cautery. That after nearly two thousand years this method should find most favor in the medical profession testifies to the integrity of some of the early observers.

While the search and research for the cause of cancer goes forward the profession will carry out the orthodox treatment in every case of cancer which presents. We should let the waiting world know that until the cause is known and a specific treatment discovered there is one cure for cancer and that cure depends upon early recognition, allowing of early complete excision. And let them know that the *x*-ray and radium treatment come after, in making doubly certain of no recurrence. In taking such a stand the profession would serve a very useful purpose in educating the victim of cancer and his friends and would materially lower the mortality rate, which today—with more cases diagnosed—has been made to appear on the increase.

There is little excuse for fatal termination in those cases of cancer which have their origin on the surface of the body, for with our present knowledge of the onset, the conduct and structure of cancer an early diagnosis should not be a difficult task. A confusion between a benign and a malignant tumor should be met by the same method of complete early excision. The hidden cancer which comes to light only when invading the body functions, or as secondary growths, is the form which cries out most loudly for a knowledge of the causation upon which adequate treatment may be based. It is in these forms that surgery, at times, can only prolong life; occasionally a judgment of inoperability must be made and the patient placed in the hopeless category with a certain length of time to live. What should be the attitude of the medical profession toward such a patient? His only hope lies in a specific treatment, which is not available. To meet this situation I would suggest that efforts be made for the establishment of a hospital in every large center where these patients would receive the most appropriate treatment and at the same time be subject to investigation.

THE CRITERIA OF THERAPEUTIC EFFECTIVENESS IN HUMAN CANCER

In determining the effects of any given mode of treatment on a tumor the majority of observers lay stress on—

1. The circulatory changes in the tumor.
2. The relief of pain.
3. The restoration of secondarily impaired function.

The foregoing points may be useful in a purely inflammatory process, but are of little or no value in judging the effects of therapeutic methods in malignant disease.

The observation of the size of the tumor itself is the sole criterion on which to judge the effect of therapeutic measures. But even this is unreliable. The fallacy of relying upon a diminution in size is shown by the fact that the tumor may advance at one point and recede at another—that cicatrization and contracture may reduce its size and give a false impression of partial recovery. Finally, stress has been laid on the prevention of tastasis or delay of recurrence. This state- ent also is misleading, for incomplete removal y be followed by apparent recovery for a g time without local recurrence.

In estimating the value of any new form of atment the following facts must be borne in nd:

1. Good results at times are obtained in cases pposed to be cancer, but in which the nature the condition has not been established on ontrovertible evidence. In such cases, the ual conclusion of the medical attendant is, *priori,* that his diagnosis was wrong, rather n that a cure of cancer had been effected.

2. Sufficient time must elapse to judge the imate results. Temporary improvement fre- ently occurs after the removal of mechanical struction by operation or by sloughing of a ncerous growth.

3. Retrogression or even spontaneous disap- arance may occur in cases of cancer, so that is not uncommon to get considerable tempor- y symptomatic improvement apart from any atment.

I should like to report a case which came der my observation, ten years ago, of a young man, aged twenty-one, with a very large operable sarcoma of the neck. She had lium and x-ray treatment without effect. hen she appeared to have but a few months live her father took her to England. While lking on the deck of the ship during a storm e fell with great force, giving her neck a vere wrench. The slight increase in swelling hich immediately followed was soon succeeded a reduction in size, until at the end of a few onths the tumor was entirely gone. It is now n years since its spontaneous disappearance d there is no recurrence.

4. Psychic influences are of great importance. is aspect of the case has been well emphasized Weil, as follows: "It is, indeed, very re- rkable that a patient who has been consigned death as a victim of a hopeless malady should gain his spirits and his appetite when he is ain confronted with the hope of a cure and the eradication of his disease? It is a phe- menon well-known to every student of the sease that a large proportion of cases respond just this manner to any treatment which is ered them. Osler has described a case of ncer of the stomach in which the mere visit a consultant of sanguine temperament, though poor judgment, whose assurance to the patient that there was no possibility of cancer, resulted in a disappearance of all the symptoms and a gain of eighteen pounds in weight. It is this psychic influence which has occasionally deluded the honest student of cancer cure and which has also so generously played into the hand of the dishonest."

The following are some of the therapeutic agents which have been advocated from time to time.

1. *Cancer Antisera.* Although a vast amount of labor has been expended on cytolytic sera it is now admitted to have failed in producing a therapeutic agent for cancer. The records of attempts to influence the growth of animal tumors by means of heterogenetic antisera are now quite numerous. In no instance has it been possible to determine that heterologous antisera prepared against tumors have a marked cytolytic effect *in vitro* or a curative action *in vivo.*

2. *Vaccination.* Experimental cancer research, thus far, gives practically no hope that human tumor can be affected by means of vaccination as a therapeutic procedure, (*a*) either by the injection of the patient's own fluids or (b) of ground-up tumors.

3. *Other Biological Methods. Doyen's Vaccine.* (*a*) Doyen, described a small coccus, which he named Micrococcus neoformans, as the cause of cancer, and from which a vaccine was prepared which he claimed gave 20 per cent. of cures. Under Sir Almroth Wright's direction the method was carefully tested in the Middlesex Hospital and found to be valueless.

(*b*) *Dr. Glover's Serum.* Dr. Glover claims: that he has isolated and cultured an intracellular organism which is found in every type of cancer. That he has produced a serum by injecting "a roan horse." That this serum renders animals immune to inoculation by cancer cells and will produce improvement or cure in cases of human cancer.

The claims of Glover are very similar to those of Doyen, whose vaccine as stated above was without value.

I was a member of the committee of the Academy of Medicine, Toronto, on the Glover serum. Dr. Glover refused to permit the committee to visit his laboratories to examine his cultures and experimental material, and it therefore had no evidence to substantiate Dr. Glover's claims on the experimental aspect of the question.

From the examination of cases and all available data the committee found no evidence that a cure had been produced by the serum in any case definitely established as cancer.

A number of cases treated by Dr. Glover's serum have been admitted into the various hospitals in Toronto, where portions of growths were removed and sections examined. These sections show no change in the cancer cells and no arrest of the growth. This is in striking contrast to the findings after the use of *x*-ray and radium, where the cells become vacuolated, etc. In addition to the above, we have seen a number of cases of cancer going on to a fatal termination after the use of Dr. Glover's serum since the Academy's report, confirming its findings and justifying the conclusion that Dr. Glover's serum is quite without value as a cure for cancer.

(*c*) *Canceroin* is the name given by Adamkievicz to a 25 per cent. watery solution of neurin, which is supposed to be identical with the toxic base of cancer. It was shown to be useless.

(*d*) *Antimeristem*, the name given by Schmidt to a culture of the supposed microbial agent of malignant tumors. It also appears to be quite valueless.

(*e*) *Coley's Fluid: The toxins of erysipelas and Bacillus prodigiosus.* Coley claims 10 per cent. of cures. If you balance against this the marked constitutional disturbance produced by the toxins, often with severe pain and (evident) shortening of life of the 90 per cent upon whose growth it produces no effect, it can scarcely be regarded as a remedy that can be recommended even in inoperable cases.

X-ray. Cells exposed to the action of the *x*-rays become vacuolated, do not take the usual stains and the cell wall disappears. In a small superficial growth, such as rodent ulcer, the cells are penetrated by small round cells and leukocytes, which rapidly organize. Thus the growth slowly atrophies and disappears and is replaced by connective tissue. Around the normal edges an inflammatory reaction occurs. It is worthy of note that cancer cells of different types may be rodiosensitive in varying degrees.

The problem of *x*-ray therapy of cancer resolves itself into the administration of the correct dose in superficial cancer.

The roentgenologists are suggesting that a number of treatments by *x*-ray be given in cases of cancer *before* as well as *after* operation. I personally cannot see any advantage in delaying an operation for cancer for the purpose of preliminary radiation. After the growth is removed radiation is always employed and seems of value. Roentgenologists are also claiming to be able to cure superficial cancer, such as rodent ulcer and epithelioma of the lip. I take issue with them in recommending this as a substitute for operation. Why should treatments with *x*-ray or radium be continued for weeks or months when a ten minute operation will remove this superficial growth. In a superficial ulcer it is quite possible to get healing by the use of the *x*-ray and a conclusion be reached that the disease is cured, while at the same time some deep cells have not been reached and later manifest themselves as metastasis in the deep glands. Further, while the treatment of the superficial ulcer is going on, metastasis may be developing in the glands.

In deep cancer, *x*-ray may be used (1) as a palliative measure in inoperable cases; (2) as a prophylactic postoperative measure. Some roentgenologists are recommending and using a ray of much greater intensity and penetration. The risk of severe burning such as one has met with in the past is said now to have been overcome by the new technique.

Radium. Practically all that has been said in regard to *x*-ray applies with equal force to radium. Radium seems to have a special place in carcinoma of the cervix uteri. Our position in regard to the use of *x*-ray and radium should be made very clear. I take it that these methods are used only to supplement surgery and not to replace it.

Surgery still offers the best means of relief for cancer, and when the condition is recognized early enough a cure may be effected in a considerable proportion of cases.

A word should be said in commendation of the excellent work done by the Cancer Committee of the American Medical Association in helping to educate the public upon the paramount importance of seeking early advice in regard to any unusual lump or swelling.

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THYROID FUNCTION FROM A CHEMICAL VIEW-POINT

A. T. Cameron, F.I.C., F.R.S.C.

Department of Biochemistry, University of Manitoba

IT is sometimes useful to be dogmatic. A crystallized statement rivets attention, and challenges contradiction. In such a statement an inaccuracy is more capable of detection than in those elaborate summaries of researches which are frequently perplexing by reason of the inconsistencies of their components. If there be no gross inaccuracy chemical data can be more usefully presented in such dogmatic form to that large body of clinicians who regard things chemical with at least dislike, if not loathing.

The chemistry of the thyroid gland and thyroid function has reached a stage at which one can reasonably hope to present the truth, and little but the truth, though we are perhaps some distance from a knowledge of the whole truth. The amount of work accomplished already is enormous, and any limited number of references is misleading since so many must be omitted. Our knowledge is based largely on the work of Baumann, Oswald, Marine, and Kendall. From the latter, in possession of unrivalled opportunities, we expect still more facts to complete our knowledge.

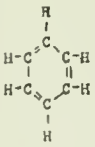
The thyroid gland differs essentially from every other mammalian tissue because it invariably contains distinct amounts of iodine, and because it elaborates at least two organic compounds containing iodine. Normal diet contains sufficient iodine for thyroid requirements. The element occurs in food almost entirely in organic combination. During digestion iodine is split off at a varying rate as iodide, and in this form circulates in the system and is excreted. Administration of iodine as iodine, iodised-protein, or iodo-fat results in a similar production of iodide, the only varying factor being the rate at which iodide is set free. It is extremely doubtful if any useful purpose is served by feeding iodine in any other form than sodium (or potassium) iodide (excluding, of course, thyroid itself, and thyroxin). Small quantities over a prolonged period will always produce greater effects than larger ones over short periods, since the greater portion of the iodine, however administered, is rapidly excreted as iodide. When distinct amounts of iodide are present in the blood certain tissues convert it to organic form; e.g., it is excreted in small amount in the hair. Blood normally contains about one part of iodine in ten million. This circulating iodine is a mixture of iodide and of the thyroid compound thyroxin.

The thyroid acts as an iodine-filter, and the greater the amount of iodide circulating in the blood, the greater is the iodine content of the gland when this is subsequently examined. The extreme limits of iodine in normal thyroids of fishes, birds, and mammals are 0.01 and 1.16 per cent. in desiccated tissue. The average normal amount in adult man is 0.2 per cent. in desiccated tissue, 0.04 to 0.05 per cent. in fresh tissue. The amount increases steadily during adolescence, is greatest between 30 and 50 years of age, and then decreases. This iodine is distributed throughout the tissue elements of the thyroid, and is not concentrated in the colloid. It is present mainly as *iodothyroglobulin,* a typical globulin soluble in one per cent. sodium chloride: this globulin appears to be elaborated by the cells of the colloid vesicles, and stored as the colloid or as one of its principal constituents. Iodothyroglobulin may amount to 60 per cent. of the dry weight of the thyroid gland. Its constitution is constant in different species, except for iodine content, which varies in different preparations from traces to 1.7 per cent. In view of the ease with which elementary iodine combines with proteins, forming compounds containing even seven or eight per cent. of iodine, we must regard it as extremely likely that the thyroglobulin is normally produced by the secreting cells at a constant rate, and that the amount of iodine combined in it is determined by the amount of iodine coming to the gland in the circulating blood.

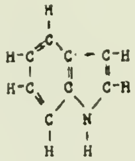
The thyroid pours out into the blood-stream not the complex globulin, but the relatively simple compound *thyroxin,* an iodine derivative of the important amino-acid *tryptophane;* (beta-indole-alpha-aminopropionic acid); their relationship to each other, and to benzene, indole, and propionic acid are shown by the formulae:

CH_3-CH_2-COOH

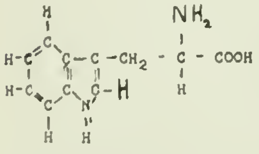
Propionic acid



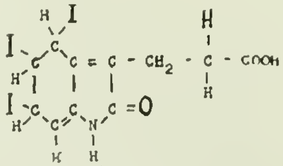
Benzene



Indole



Tryptophane



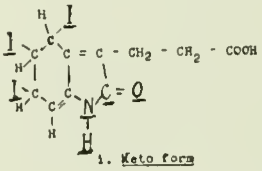
Thyroxin

The differences between the molecular structures of tryptophane and thyroxin are shown by the larger type used for certain atoms.

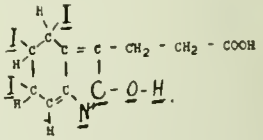
Tryptophane is normally present in the circulating blood as a product of protein digestion. Normal diet invariably contains excess, part being broken down by bacterial action in the intestine to indole and skatole. It has been estimated that a man of average weight, living on an average diet, consumes 2.5 to 3 grams of tryptophane, in protein combination, per day, and that one-half of this amount would prove sufficient for his body needs. The thyroid has therefore always under normal conditions a sufficient supply of tryptophane for the manufacture of thyroxin.

The probable sequence of events is the building of the modified tryptophane radical into the thyroglobulin complex, and its subsequent iodization to a thyroxin radical; this is at a later period split off and passed into the blood stream.

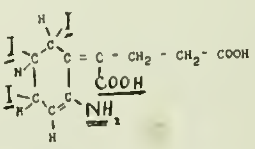
When thyroid tissue is fed it is digested in normal fashion, and in the intestine is finally resolved into a mixture consisting largely of amino-acids and the *imino-acid* thyroxin. These are absorbed. Thyroxin given by the mouth is also in part absorbed unchanged, though a considerable proportion seems to undergo bacterial decomposition in the intestine and to be wasted. The net result of the continued administration of thyroid or thyroxin by mouth, or the repeated injection of thyroxin intravenously is the maintenance of a distinct amount of thyroxin in the circulating blood. Under these circumstance the thyroid enters into a resting condition in which the colloid vesicles are distended; the appearance of the gland is anaemic. In the young animal the gland ceases to grow at normal rate. It seems not improbable that the conditioning factor which determines the output of thyroxin from the normal gland is the amount of thyroxin in the circulating blood. Such a stimulus resembles to some extent that exercised by the glucose content of the blood in determining whether glycolysis shall proceed in the liver.



i. Keto form



ii. Enol form



Thyroxin is a catalyst producing oxidation. Its activity is due to the presence of the linkage "-NH-CO-", dominated in the spacial arrangement of the molecule by the juxtaposition of three large iodine atoms. This linkage is easily ruptured and reformed in thyroxin. The three important variations in the thyroxin molecule are shown in the following formulae, in which the important atoms of the molecule are shown in larger type, and underlined:

Thyroxin is not toxic in itself. Large single doses produce no toxic symptoms. But the presence of this catalyst in circulating blood and tissue-cells increases every oxidative process. Tissue catabolism increases. The circulating compounds of relatively small size that constitute the food-units of the tissues tend to be oxidised before they can be utilized. Basal metabolism and total metabolism are increased. In other words there are increases in oxygen consumption and in carbon dioxide and nitrogen excretion (with an accompanying increase in phosphate excretion). The injection of one milligram of thyroxin produces a two per cent. increase in the basal metabolism of a 70-kilogram man.

Thyroxin in normal amounts controls tissue catabolism. Thyroxin in amounts greater than normal produces undue tissue-destruction, and at the same time cell-starvation, and so acts as an indirect poison. Toxic results can only be produced by a prolonged condition in which there is too great a thyroxin concentration in blood and tissues. Under normal conditions the basal metabolism of any individual is constant within fairly narrow limits. When the thyroid functions subnormally and thyroxin output is decreased. the basal metabolism, the register of the minimal catabolic processes of the cells, also falls. Administration of thyroxin as thyroxin or as thyroid brings it back to normal, and it remains normal just so long as this administration is continued. Basal metabolism measurements will determine the correct thyroxin supply. For prolonged administration by mouth desiccated thyroid seems more suitable, although it is essential that the iodine content of such thyroid be known, since its thyroxin-effect will be approximately proportional to its iodine content. *Thyroid preparations differ in iodine-content over rather wide limits, and the iodine percentage should be stated.*

The conditions in myxoedema and cretinism (provided the cretin be treated at a sufficiently early age) can therefore be completely removed by continued thyroid administration, controlled, to produce optimum results, by occasional determinations of the basal metabolic rate.

Goitrous conditions are as difficult to classify from a chemical, as from a clinical standpoint. The simplest is *foetal adenoma* of the thyroid. In this the net result is a larger number of secreting cells, resulting in a simple hyperthyroidism. There is continued over-production of thyroxin, and consequently an abnormally high catabolism, revealed by a high basal metabolism. In *Graves' Disease* the function of the thyroid is disturbed by some factor outside the thyroid itself, and the resulting hyperthyroidism is only one of the effects. Thus the exophthalmos is not to be related to the disturbed thyroid function, but is a concomitant effect of the original disturbing factor. In Graves' disease the thyroid is actively hypersecreting. This hypersecretion may be due to the active hyperplasia, to an increased activity of the original cells, or to a combination of these two. The main effect of the original disturbing factor seems to be such an increase in the rate at which thyroxin is set free from iodothyroglobulin that the thyroxin cannot be properly stored. The amount of thyroxin extractable by chemical decomposition of such glands is small. The iodine content of adenomas is also below normal, indicating a similar, if less-marked change in thyroglobulin-thyroxin equilibrium.

Tryptophane cannot be manufactured in the mammalian body. It has been suggested that if the tryptophane supply be diminished by feeding a diet containing proteins that are free or almost free from tryptophane radicals (e.g., zein, or gelatine) the manufacture of thyroxin must be diminished, and that such treatment is therefore desirable in cases of Graves' disease. The suggestion is logical, but it does not provide a means of combating the original cause of the disturbed function of the gland, nor is it certain that the thyroid would not extract the remaining amount of food-tryptophane with a resulting tryptophane-starvation of other tissues. It is to be hoped, however, that this remedial measure will be tested. Such treatment as administration of iodine, thyroid, or thyroxin is obviously excluded.

The various types of colloid goitres are the most difficult of chemical interpretation. In the initial stages of such goitres the iodine content of the gland diminishes both relatively and absolutely. Iodothyroglobulin from such goitres contains less iodine. Since the colloid increases we must consider that the globulin is being manufactured at a normal or at even an increased rate, but that iodine is not available or cannot be properly utilized to iodise the thyroxin radical. The hypertrophy may be a normal response to an iodine deficiency. A normal response, perhaps comparable, occurs in sheep, cattle, and pigs, at the onset of cold weather, accompanied by diminution in total iodine content and due to increased thyroxin output through the increased catabolism resultant on increased muscular exercise necessary to maintain body temperature.

In simple colloid goitres iodine administration in any form causes regression of the hypertrophy, and at the same time the iodine content of the gland increases. Iodine administration to growing children living in goitrous districts undoubtedly prevents the development of such goitres, whilst its use during the condition can be safely controlled by basal metabolism measurements, and so any development of hyperthyroidism prevented.

Colloid adenomas represent a series of graded conditions between the actively secreting foetal adenomas—producing increased basal metabolism—and the resting colloid gland which permits a normal metabolism.

A further careful study of a series of goitres, for iodine content, thyroglobulin content, if possible thyroxin content when some simple method of measuring thyroxin is devised, with concomitant macroscopical and microscopical examination, and careful clinical notes and basal metabolism measurements in every case before operation, will greatly increase, and perhaps complete our knowledge of the normal and pathological mechanism of thyroxin-manufacture in the thyroid.

I wish to acknowledge my indebtedness to Professor Wm. Boyd, of the Department of Pathology, University of Manitoba, who has helped me in my endeavour to obtain a clear mental picture of the various pathological conditions of the thyroid gland.

THE ACUTE APPENDIX

W. Jamieson, M.D.

Hamilton, Ontario

THIS very familiar subject needs no introduction other than to state, that in referring to "The Acute Appendix," one has in view those cases where the clinical evidence points to definite and rapid pathological changes in and around the appendix, accompanied by septic absorption of infective products. The presence or absence of certain clinical features may aid in determining what those changes are, yet a true classification is difficult, except from the pathological findings at operation. One is chiefly concerned with the presence of, rather than the type of, pathological changes.

Case 1.—A girl of fifteen who had always been healthy and apparently well-nourished said that from Wednesday till Friday she had a very sore throat. That Friday night she felt pain in her abdomen above the umbilicus and was nauseated. On Saturday the pain became severe at times and was followed by vomiting. She felt a general abdominal tenderness. Late in the evening the pain settled in the right side over the lower quadrant and was so intense that she could not lie still and it never ceased, but by mid-forenoon Sunday was much easier. The vomiting had stopped during the night. Her right side was now so tender that she hated to move, even to straighten out her limbs. At 5 p.m. there was some distention and her temperature was 101 and pulse 120. 6 p.m.—operation,—Acute suppurative appendix.

The clinical features here included all the evidence one need expect. The tonsilitis was the predisposing cause and pointed to the source, the virulence of the infection, and the history shows its termination. These cases following tonsilitis rarely end in resolution. The value of this will be appreciated if one recalls that mild initial symptoms appear for only a few hours in some instances, and after a period of two or three days of apparent recovery there is a sudden onset of symptoms of a most exaggerated type and the patient is in a very dangerous condition for operation.

Pain was the first evidence here. It is present in every case and is a warning that all is not well. It comes before any changes to the tissues. The organs of the peritoneal cavity are not sensitive to stimulations that produce pain externally, but reflexly pain is felt and it is this reflex pain that first points to the disease. It is colicy and intermittent at first and reaches its height in four to ten hours and is referred to the epigastrium or just above the umbilicus. Later it radiates to the right lower quadrant or in the direction in which the appendix may be pointing. It then becomes constant and is said by some to be a pain of "fixed posture" due to localized peritonitis, or to the stretching and contraction of unstriped muscle fibres in the wall of the appendix. By the third day the pain is less or even gone, indicating a resolution. On the contrary it may become severe due to invasion of peritoneal cavity outside localized area, indicating a spreading peritonitis.

Tenderness and pain are the two most reliable symptoms. It is also present in every case. It begins with a general abdominal sensitiveness, due to hyperstalsis of the small intestines, or may be localized from the beginning. This localized point of tenderness is the surest guide to the site of the trouble. It begins with a small area and spreads with alterations of the position of the inflamed appendix and its effects on neighbouring organs and tissues. The position of McBurney's point is approximately the same in all individuals, irrespective of the position of the appendix and results from reflex stimulations in the abdominal wall of the sensory nerves or the afferent part of a reflex loop. With this, motor fibres of this afferent part of the loop are sometimes stimulated, resulting in muscular rigidity and spasticity. This is not always present and is an unreliable factor in the diagnosis.

Nausea or vomiting, or both, may be present and occurs near the onset, i.e., within one to four hours. It is preceded by pain of the colicy type and is rarely due to localized pain. It disappears early or as soon as the peristalsis of the small intestines is arrested. The vomiting is never fæcal. Vomiting of blood does occur but it is exceptional. The symptom of nausea or vomiting is an important diagnostic feature but not always present.

Temperature represents the absorption of infective material in the appendix. It varies from 99 to 104. This latter temperature is exceptional and if occurring near the onset should make one suspicious of infectious and contagious diseases. A temperature of 99 to 101 may be considered typical. A sudden drop in temperature may be due to drainage into the cæcum with resolution to perforation or to gangrene. Along with temperature, as evidence of septic absorption is leucocytosis, in which a stationary white count and an increasing palymuclear count point to gangrene.

An early diagnosis of this treacherous disease is most important. It may be difficult or it may be simple. X-ray and some of the special examinations are contraindicated. The physical examination with the history of the onset and previous attacks if any, the age of the patient are the real factors in the solution. The examination of the abdomen will determine whether or not tumefaction is present, its character (and mobility) whether there is muscular rigidity and tenderness, (elicited by pressure or by suddenly relieving it) over right lower quadrant and its point of maximum intensity whether pressure over left lower quadrant causes distress in right lower quadrant: whether pressure along the outer border of ascending colon produces tenderness in that region; whether extending the flexed right limb with or without pressure over McMurney's point gives pain. A rectal examination must be made. Appendicitis is usually a disease of early adult life, yet no age is free In one hundred of my cases, eleven occurred between the ages of five and ten: thirty-four between ten and twenty;thirty-one between twenty and thirty; sixteen between thirty and forty; three between forty and fifty and five between sixty and seventy.

Every case is a special or individual one demanding special solution, the more so the greater the remoteness from childhood. The type of the individual must be considered, whether or not he is of a nervous temperament, his ability to give a definite account of his sufferings or whether he is trying to make light of them.

Case 2.—A man aged 47 at 10 a.m. complained of epigastric pain and, shortly afterwards vomited. During the day the pain became less but he felt slight tenderness in the right lower quadrant. At ten o'clock that evening he was sent to the hospital. Examination showed slight tenderness in right lower quadrant, temperature 98, pulse 58. Patient looked well and did not complain but expressed a desire to be operated on. Many cases present so little evidence of trouble or complain so little, that one hesitates to operate. Then some uncommon feature presents itself and aids the diagnosis. In the above case the pulse was a full bounding one. This, with the history and his desire for operation, made me think there was more serious trouble than the symptoms represented. Operation—gangrenous appendix. This subconscious feeling of impending danger is important and has some value in the diagnosis. Diagnosis is often difficult at the time of the onset or three or four days later when the symptoms are indefinitely mixed and the cause obscured. Sometimes in the beginning, the symptoms are attributed to some form of food and called indigestion or colic due to the nature of the pain. If the latter, there is no point of tenderness and pressure relieves instead of increasing the distress. In many instances a purgative is given with disastrous results.

Case 3.—A boy 8 years old complained of sudden severe abdominal pain, and vomited several times. It was attributed to food. After the vomiting he felt better and the pain was less. A dose of oil was given the next morning and that evening the pain appeared again, this time in the right lower quadrant, and so severe that he could not straighten up. Pulse 120. Temperature 102. Operation—ruptured appendix.

There are again cases with unexpected symptoms such as the ensuing history gives, symptoms due to the position of the appendix.

Case 4.—3 p.m. A boy sixteen years old was suddenly seized with severe pain in the region of the bladder and with a desire to urinate. He was nauseated but did not vomit. The next morning he felt quite well and got out of bed. 48 hours later severe abdominal pain and tenderness over right lower quadrant extending downwards. Rapid pulse and temperature; distention; rectal examination—marked tenderness right side. Operation,—ruptured appendix with tip against the bladder, large fæcal concretion and free pus in peritoneal cavity.

Sir Berkley Moynihan in his work on abdominal operations speaks of the positions of the appendix as follows:

(1).—Lying with its tip pointing towards the spleen and behind the termination of the ilium.

(2).—Hanging over the brim of the pelvis.

(3).—Lying in the iliac fossa with its end near Poupart's Ligament.

(4).—Lying along the outer side of the ascending colon.

(5).—Lying behind the cæcum and ascending colon in the retro-colic fossa.

One associates abdominal pain and tenderness in the right lower quadrant with the acute appendix because from experience we find it the most usual. Other conditions are confused with it. Acute intestinal obstruction, renal and ureteral calculi account for many mistakes in diagnosis. Time will not permit me to say much more, but in referring to obstruction the pinched facial expression and evidences of shock and the intense thirst should at least be a warning. With renal colic the patient tells us the pain started in the back and was shortly felt around in front of the abdomen and on down, also he gives us an account of hæmaturia and tenderness at the renal angle. In ureteral calculus the symptoms are much the same except that the starting point depends on the location of the stone. As this shifts so does the starting point. Very often the stone lodges at the brim of the pelvis and it is here that the symptoms resemble those of appendicitis. As to the treatment, nothing need be said. These are surgical cases and should be treated as such. If in the country, don't move your patient, but operate in the home and as early as possible.

FAVUS

A REPORT OF SEVENTEEN CASES

H. A. Dixon M.B., and A. H. Rolph, B.A., M.B.

From the Out-patient Department and the X-Ray Laboratory

The Hospital for Sick Children, Toronto.

THE following observations were made in a series of seventeen cases of scalp Favus seen in the Dermatological Clinic, and may serve to draw attention to the problem which Favus presents in Canada, to-day.

As the report covers a period of sixteen months, viz., December 1919 to May 1921, it is interesting to note the rapid increase in the number of cases seen. Previous to January, 1920, two cases were noted. During 1920, six cases, and in the first four months of 1921, nine cases. The increase directly corresponds with the greater number of immigrants entering Canada from Poland since the war. Of all the cases seen, only two were referred to the hospital by the immigration authorities.

All the children were of foreign origin—sixteen of Polish parents and one of Austrian parents. Two of the patients were born in the United States and one in Toronto.

The ages varied from five to seventeen years. The sex showed little variation, the disease being found in (8) male and (9) female patients.

The fungus responsible for the disease was demonstrated in (12) twelve of the seventeen cases.

Description.—According to Sequeira[1]. Favus is contagious and widely distributed, but is most common in the Eastern countries of Europe, in Asia Minor and in Egypt.

The part most commonly affected is the scalp, but it may attack the skin, the nails, and occasionally the mucous membrane. Cases of diarrhoea have been reported due to the infection of gastro-intestinal mucosa.

Children are most commonly affected, but, as it is difficult to eradicate, the affection is apt to persist to adult life. One seldom finds the scalp disease beginning after the age of fifteen years.

The inoculation takes place from child to child, but it may occur through contaminated brushes, clothes or hats, rarely, it may be transmitted from cats, dogs, rabbits, horses, cattle, fowl and mice.

Scalp.—On the scalp, the lesion is known as the scutulum, and consists of a small sulphur yellow disc with a central depression or cup usually pierced by a hair. The affection develops slowly, beginning as a superficial inflammation or merely a hyperæmic spot. There is soon noticed a minute yellow crust at the hair follicle and surrounding the hair shaft. The yellow crust increases in size—growing slowly to form the cup with a diameter about that of a small pea and slightly raised above the scalp. Removal of the cup shows a hæmorrhagic area.

The hairs are involved early, the mycelial threads growing down between the inner root sheath and the hair. They become brittle lustreless, and split readily. After a time, the crusts disappear from the earlier lesions leaving atrophic areas.

The progress is slow, months elapsing before there is extensive involvement. While the first patch increases, new foci appear at a distance in the scalp.

Ætiology.—The fungus which is responsible for at least ninety-five per cent of the cases of Favus in the human subject is the Achorion Schœnleinii (MacLeod)[2]. It is easily demonstrated by mounting scales and hairs in a few drops of Liq. Potassæ. The mycelium consists of narrow branching filaments; they vary in length and thickness and show round, oval or irregularly shaped spores. The hair shaft may be packed with mycelial threads. They are situated in the centre of the hair and lie parallel to the long axis.

Pathology.—The underlying corium shows

marked signs of inflammation, dilated capillaries, œdema, infiltration of lymphocytes and small round connective tissue cells. The change is the result of the toxic action of the fungus.

Differential Diagnosis.—The disease has to be distinguished from Ringworm, Seborrhœic Dermatitis and Psoriasis. From Ringworm, by the powdery scales and atrophic bald patches, the type of fungus and by the characteristic sulphur yellow cups. From Seborrhœic Dermatitis and Psoriasis of the scalp, it is distinguished by the crusts being friable, yellowish in appearance, and by the peculiar lustreless appearance of the hair.

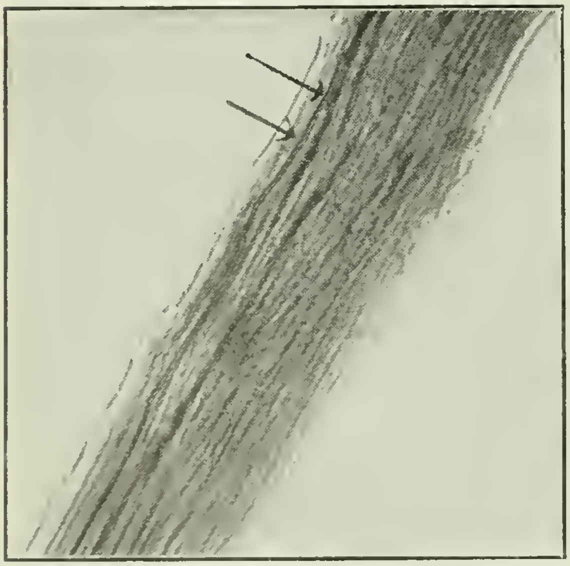


Fig. 1.—Mycelium of fungus in hair showing branched filaments. Enlargement made from microscopic specimen by W. L. Robinson, B.A., M.D.

Prognosis.—If left untreated, it may persist indefinitely, or may undergo resolution as a result of inflammation and cicatricial changes. This effect is well illustrated by the accompanying photograph.

Treatment.—We have tried various antiseptic ointments in treatment, but without success. The most efficient treatment is depilation by means of the X-ray as in Ringworm. A cure can be effected in from four to five weeks. While the hair is falling, an ointment should be rubbed into the scalp—the most effective being Ung. Hydrarg. Amm. Any septic condition such as Impetigo is likely to be much aggravated, and should, if possible, be eradicated beforehand, as the X-ray temporarily reduces the vitality of the scalp.

The Technique of depilation as carried out at the Hospital, is that of the Kienbock-Adamson Method with slight modifications. (Adamson)[3]. It is by no means a difficult procedure but it requires the utmost care and attention to detail, so that we have refused as yet to entrust it to the hands of a technician. As, however, it requires the undivided attention of the operator for one and a half hour's time, this is a rule which we cannot hope always to enforce. Fortunately, the margin of safety between a dose which will give an incomplete depilation and that which produces a permanent one is reasonably large, so that scrupulous care with a standardized technique carries with it very little danger of unfavorable result.

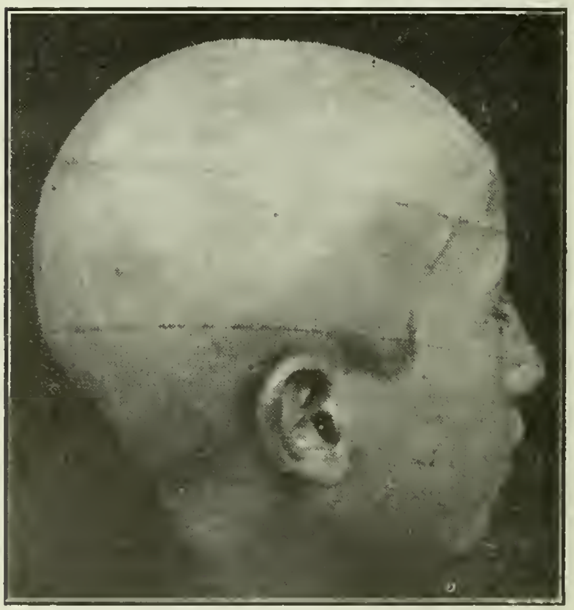


Fig. 2.—Depilation produced by X-ray.

Before the treatment is attempted, we insist that all irritating applications such as iodine or other strong antiseptics shall be discontinued for at least two weeks, although we make no objection to the use of a very mild ointment sufficient to lessen the danger of spreading the infection to others and to keep the crusts from becoming too thick and troublesome. Immediately before treatment, the hair is cropped as short as possible and all crusts carefully removed. The head is then marked with a skin pencil as follows: A point is chosen in the frontal region about one inch above the hair margin, in the mid-line. Measuring backwards from this with a piece of bandage ten inches long, we mark a similar point in the lower occipital region, while half way between these two points we obtain a third point, on the top of the head, which will be exactly five inches distant from each of them. Lastly, a point is found on each side of the head about an inch above and a little anterior to the external auditory meatus which is likewise five inches distant from each of the first three points. This may prove somewhat difficult in heads of unusual shape, but can generally be managed by altering your point of departure and remarking the five points in turn. All of these points are now joined by lines which will cross at right angles. These serve as a guide for the direction of the rays.

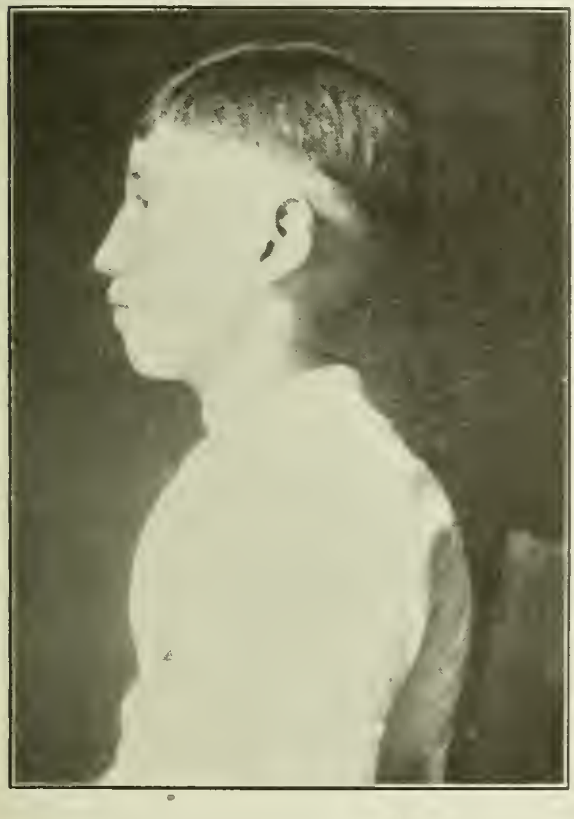


FIG. 3.—Same patient six months after depilation.

The patient is then placed in a sitting or reclining posture, according to the area to be rayed, with his head held steady in some form of retaining apparatus, and each area given a depilating dose in turn, all exposed portions of the face and neck being covered with lead foil or other ray-proof material. If the central rays are directed perpendicularly on each of the five points in turn, from a target-skin distance of six and one-half inches, and the oblique rays of the several exposures allowed to overlap at will, every part of the scalp will receive the required dose with mathematical exactness.

It will be readily seen that these two factors, the target-skin distance and the direction of the rays, are of the first importance and require great care in adjustment. To facilitate this, Dr. Adamson invented a small wooden tripod to reach from the tube-holder to the patient's head, but we have found this unsuited to the present day American type of apparatus and have discarded it in favor of a pointer made by embedding a short pencil in a small plaster-of-paris cone which will fit snugly into the smallest conical diaphragm or "treatment-cone" of the tube-stand. This, cut to the required length, will give the exact distance required, when the tube holder is lowered until the pointer just touches the head. Moreover, by the usual manipulations of the tube-stand, it can be made to point directly at the required point, and simultaneously in the plane of each of the intersecting lines, thus giving a true perpendicular with great precision. This pointer, together with the "treatment-cone," can then be removed without disturbing the position of either the tube or the patient, and the treatment proceeded with.

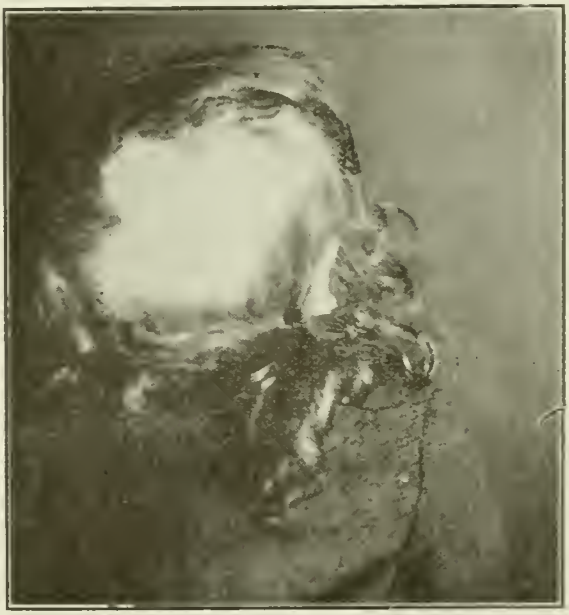


FIG. 4.—Baldness due to scarring in patient not treated by X-ray.

A target-skin distance of six and one-half inches, as called for by the Kienboek-Adamson method, has also proved awkward when one is working with American apparatus, as it brings the metal tube-holder too close to the patient's head, thus introducing a very real danger when one is dealing with children, unless every part of the patient's body is strapped securely to the table; which is otherwise unnecessary. Hence it has become a common practice on this continent to make target-skin distance either eight or ten inches and increase the exposure accordingly. Our own practice hitherto has been to use a ten-inch distance, which has worked very satisfactorily, but we consider eight inches to be preferable, as giving more exact dosage to the overlapping areas and we intend to standardize on that in the future.

The actual dose which we have been giving to each area has been five milliamperes at a six-inch gap for two and a third minutes at a ten inch distance, the spark gap being measured across moderately sharp terminals. No filter is used. This dose, we have checked up by means of Sabouraud pastilles and found to be equal to four-fifths B tint viewed through a tintometer. For some unexplained reason, however, we have found the dose to vary slightly on different makes of machines, so that it is advisable to standardize the work on one machine and stick to it. In very young or very fair patients we lessen the dose a little.

The hair usually begins to fall at the end of two weeks and depilation is complete in about three weeks. A new growth of hair is generally visible over all parts of the scalp in six or eight weeks' time and in four or five months' time is quite thick and well grown.

Conclusions

1.—In Canada, Favus is found chiefly in immigrants from Poland.

2.—It would be advisable for the Government to take stringent precautions to prevent such cases entering Canada except on condition of their reporting to hospital immediately for treatment.

3.—Early diagnosis is essential in order to prevent patchy baldness by cicatrix formation.

4.—Depilation by means of the X-ray offers a successful method of treatment.

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2.—Macleod, J. M. H. Diseases of the Skin 1920.
3.—Adamson, H. G. Technique of Depilation. (Lancet 1909, p. 1379)

INTUBATION VS. TRACHEOTOMY

J. M. Rogers, M.D.

Ingersoll, Ont.

THE general practitioner is frequently brought face to face with the necessity of deciding rapidly what he must do to relieve failing respiration, in those cases of dyspnoea resulting from membranous croup. The choice usually lies between two operations, intubation and tracheotomy. Which shall he choose and what are the prospects for relief from the terrifying situation which confronts him? For many years now the growing tendency has been to advise intubation and discourage tracheotomy. In a properly equipped isolation hospital with a thoroughly trained surgeon constantly at hand, no one would deny that intubation would be the operation of choice. Unfortunately it is not possible to have a large portion of the cases met with in general practice treated in such favorable surroundings, as many towns and rural districts are not provided with such hospitals. It thus becomes necessary to operate in the patient's home, often with few or no conveniences, without assistants and with very poor light. Under such circumstances what is the operation of choice? Should the operator be fortunate enough to have special training in intubation it might be advisable for him to undertake this operation in preference to tracheotomy. With conditions as I have mentioned it is not easily performed, in fact it is one of the most difficult of the minor operations and when you take into consideration the fact that the tube is likely to be coughed up at an inopportune moment when no physician is present to re-insert it, it is often a question whether or not one is justified in performing it. It is also a well known fact that in certain cases of low involvement of the trachea the tube does not reach far enough down to give relief, and lives have been lost in this way, as not enough time was left to do a tracheotomy. Unfortunately there is a large number of competent physicians and surgeons in both towns and cities who have had no special training in intubation, and in such cases the attempt is more than likely to be unsuccessful. In the Municipal Hospital for Contagious Diseases, Chicago, the mortality in Intubation cases was reduced from 50.4 in 1918 to 15.6 in 1920 by the insistence on greater efficiency by staff. In cases of this description I am of the opinion that tracheotomy is a much safer procedure and will result in saving a far greater number of lives than would result from the attempt at intubation. Every physician who is not fortunate enough to have at hand a confrere who is competent to perform an intubation should be capable at least of performing a tracheotomy in any emergency and it is with the idea of impressing the members of the medical profession with this necessity that I am taking the liberty of drawing your attention to this subject today. Every man in a general practice ought to have in his mind accurate details of the operation for tracheotomy and should be able to perform it accurately and quickly without any trained assistants. With the idea of refreshing your memories as to the details of this operation may I quickly review its main points and the dangers which one is likely to encounter. In the first place where a patient, usually a child, is suffering from dyspnoea from membranous croup a general anaesthetic is out of the question. Two dangers may be mentioned. Asphyxia is almost sure to result from paralysis of the accessory muscles of respiration, and secondly aspiration pneumonia is likely to occur from infected blood, pus or secretions being drawn into the lung because of the abolition of the cough reflex. Local anesthesia can be quickly and satisfactorily produced by the intradermaticnot hypodermatic-injection of 1-10 of 1% cocain solution made preferably from normal saline. We were formerly advised to divide carefully the tissues layer by layer on a grooved director. This is a waste of time and quite unnecessary. The skin and subcutaneous cellular tissues should be divided in the middle line with one stroke of the knife, this incision should extend from the thyroid notch to the suprasternal notch, the incision being a shallow one. The subcutaneous tissues should then be divided after being clamped. The trachea should be laid bare at its upper part first and then followed downwards. The isthmus of the thyroid may be drawn up or down as is most convenient and we are now ready for the incision in the trachea. In children some difficulty may be experienced in keeping the trachea from slipping to one side of the knife while being incised. I have found it of great assistance to steady the trachea with a hook inserted into it. Care should be taken not to pass the scalpel too deeply lest the posterior wall should be injured and the oesophagus wounded. It is wisdom to control all hemorrhage before opening the trachea. By this means little difficulty will be experienced. The trachea incision should include at least three rings, and, except under special circumstances, should never be higher than the second ring. If the operation be performed at a higher point than this laryngeal stenosis may be produced by approaching too closely to the subglottic tissue, which is quite subject to chronic hyperplasia.

The edges of the tracheal wound are now held open and the canula of the tracheotomy tube inserted. Care should be taken not to stitch the wound too closely to the tube. The opening above and below may be lightly packed with gauze which should be fastened to the retaining tape with safety pins. These retaining tapes should be of the best linen and should not be *tied* to the canula as there is danger of their slipping. A slit should be made near the end of the tape and after slipping the perforated end through the slot in the tape plate the distal end is passed through the perforation and thus made secure.

While every case of tracheotomy for membranous croup may be said to be an emergency, there is usually sufficient time to permit of the leisurely operation described above. Occasionally, however, a case presents itself which is so acute that the breathing is impeded, and it is evident that unless immediate relief is obtained death will result. In cases of this type an emergent operation should be done.

Formerly a simple stabbing of the cricoid membrane or trachea was advised but so many accidents followed that the method has been pretty generally abandoned. A rapid and comparatively safe method may be described as follows: with the forefinger and thumb of the left hand the soft parts including the jugular veins and carotid arteries may be pressed back and the trachea brought into prominence. With the first incision exactly in the middle line the skin and soft tissues are divided down to the trachea. The next incision opens the trachea which is steadied by firm pressure of the thumb and finger. After locating the rings of the trachea with the finger, the finger is moved slightly to the left and the scalpel carried down close by its side to the very centre of the tube. No attempt is made to control hemorrhage and consequently the operation after the first incision must be done by means of the sense of touch. After breathing has been established bleeding may be leisurely controlled. The main points to remember in the operation are that the centre line is the area of safety, the higher one goes the wider this area; the upper limit is the thyroid notch while below it narrows to the vanishing point. After the trachea is reached the line of safety falls below the second trachea ring.

UTERINE HÆMORRHAGE FROM THE VIEWPOINT OF THE GENERAL PRACTITIONER*

F. A. L. Lockhart, M.B. (Edin.) M.D. (McGill)

CHRONOLOGICALLY, haemorrhage from the female sexual organs may be divided into that of youth, middle and old age, but certain forms may be met with at any time. It is one of the most important symptoms occurring in gynaecological practice, or, in fact, in the every day work of the general practitioner, as upon the correct diagnosis of the cause may depend the life of the patient.

The sexual life of the female is ushered in by the appearance of a bloody discharge at the vulva. The young girl, of about fourteen years of age in this country, has been irritable and nervous with a certain degree of lassitude for some weeks. She suddenly discovers a spot of blood on her under garments, this blood gradually increasing in amount for a few days and then slowly ceasing. It is her first menstrual period, heralding the dawn of womanhood. Normally, this recurs periodically each month, but at times the flow becomes excessive or is seen too frequently, in which case the condition is pathological. This excessive blood loss may be due to some one of various causes, such as excessive ovarian activity, general ill-health, psychological conditions, uterine growths or disease of the endometrium. Each variety calls for a diagnosis of the cause and for appropriate treatment, but it is often extremely difficult to differentiate the one from the other.

Excessive ovarian activity may be lessened by change of environment, habits or diet. If a girl's mode of life brings her into close contact with members of the opposite sex, as for example where she works in a factory with males, change of occupation will be useful. Her literature ought to be examined into, as some of the novels which, unfortunately, come into the hands of the young, are liable to direct their minds towards sexual matters. Her food should be nourishing but non-stimulating, her diet, both mental and gastronomic, being in need of dilution. Where she is thin, pale and evidently outgrowing her strength, the condition demands good food, plenty of exercise, fresh air, especially at the sea-shore or in the mountains, and tonics, but never any preparation containing iron during the actual flow, as this only increases the blood-loss. If there is any cause for worry remove it and you will frequently be rewarded by a marked improvement in the condition. Total cessation of study may be necessary, but her mind must, at the same time, be kept occupied, so that introspection may be prevented. In such cases, one should study the individual and treat her rather than the actual symptom

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*Read from the Vermont State Medical Association October, 1921

Of uterine growths, the one to be most dreaded, and therefore to be most carefully sought for, is sarcoma, as this disease is more prone to attack the young than the more mature. Where it is present, you will have rapid emaciation, a local enlargement of the uterus and a sanguinous discharge of a watery nature and containing hard, rice-like particles, thus producing the well-known "rice-water" discharge. A polyp or sub-mucous fibroid is not commonly met with in these very young girls, but one does see them occasionally, and then they call for removal of the growth. In the case of the sarcoma, of course, one should make a clean sweep of the pelvic contents, removing not only the uterus but both sets of appendages as well, on account of the extreme virility of this form of tumour. One case which came under the observation of the writer many years ago strikingly illustrates the above. The patient was a young girl, twenty-two years of age, who was admitted to the wards of the Montreal General Hospital complaining of a thin, watery discharge, which was stained with blood, and an abdominal swelling. Sarcoma of the ovary was diagnosed and a large sarcomatous tumour of the left ovary was removed. She made an uneventful recovery from the operation but within six weeks she returned with a recurrence so extensive as to be beyond hope of obtaining a good result from further surgical interference. This taught a lesson which has probably saved the lives of several future patients.

In a few cases, there is an hyperplasia of the endometrium, in which case drugs will be of little benefit and curettage will be indicated, but, especially in the young unmarried girl, this should be reserved as a last resort. Where it is necessary and the tissue removed is examined, you will usually see that the endometrium is more or less thickened and that its vessels are greatly increased both in number and size. To actually stop the haemorrhage in these juvenile cases, and in many occurring in older patients, certain animal substances and various drugs may be used. Normal horse-serum may be injected deeply into the muscles, preferably of the buttock, in doses of 15-25 cc. and this may be repeated twice a day for two days. Extract of the mammary gland is sometimes exhibited in doses of five grains thrice daily after food; this is supposed to have the effect of stimulating the uterine tissue to contract. The administration of the latter substance ought to be commenced two or three days before each period and continued until it has produced the desired result, or, at all events, for two or three days. If it is decided to use actual drugs, a combination to be recommended is one of calcium lactate, ten grains, with one grain of ergotine. Place these in a capsule and instruct the patient to take two capsules as a first dose and then to take one every four hours for four doses. Calcium lactate, if continued indefinitely, loses its effect, so that not more than four or five doses ought to be taken without an intermission of at least twelve hours. Cotarnin hydrochlorate, sold under the trade name of "stypticin," in doses of ¾ gr., three times a day or even every four hours, will frequently be found to be very beneficial. The fluid extract of ergot, in combination with strychnine in small doses continued for some days or weeks, is to be recommended in some instances.

In addition to local causes, menorrhagia and metrorhagia, in females of any age, may be produced by diseases of the general system. Syphilis causes them by producing a large soft unhealthy uterine muscle, greatly lacking in tone, so that some cases of obscure origin will be found to respond to anti-syphilitic remedies. Any condition producing an obstruction to free circulation of the blood may produce uterine haemorrhage. This is seen in diseases of the heart, kidneys and liver, and the possibility of such affections being present must always be carefully considered and examined into before deciding that, just because the patient is a woman, the bleeding is of uterine origin.

Uterine haemorrhages of established adult life and middle and old age have similar causes and so will be considered together, although in the earlier years inflammatory conditions and pregnancy are more frequently met with than later on. Occasionally, inflammation of the appendages produces such a degree of pelvic congestion that the vessels of the endometrium break down.

causing more or less profuse bleeding. It will often require care to differentiate this condition from extra-uterine pregnancy, but in the inflammatory case the patient has a higher temperature than in gestation, the pulse is fuller and more bounding and there may be an history of some previous infection. There will also be an increased leucocytosis, although a moderate increase in the white cells is sometimes observed in the case of a pregnant tube. This is, however, the exception. The indication here is to reduce the inflammation and when this has been accomplished the bleeding will cease. On no account should curettage be resorted to in such a case, as this would only result in not only spreading the infection locally, but, possibly, in a general systemic poisoning.

When extra-uterine gestation is present, accompanied by external bleeding, the latter is of a special type. The patient may or may not have missed one or more periods and then have seen a slight reddish discharge at the vulva. This is usually small in amount but recurs every day and is often described as a "dribbling." The haemorrhage in this instance comes partly from the engorged endometrium and partly from the tube of the affected side, either from simple engorgement of the lining or from minute lacerations of the tubal wall caused by the enlarging ovum. The diagnosis may be made from the history of amenorrhoea, pain in one illiac region and the presence of a mass in the affected side. Even where there has been no irregularity of menstruation, bleeding, such as has been described above, should always lead one to strongly suspect the presence of an ectopic pregnancy and the patient should be kept under constant observation. The actual haemorrhage will not require treatment but the affected organ must be removed, this causing the bleeding to cease.

Some tumours of the ovary cause uterine blood loss but the case is readily diagnosed by the discovery of the growth, the removal of which is followed by the disappearance of the symptoms.

Chronic inflammatory conditions of the uterine tissue, either of the muscular wall or its lining membrane, may produce a discharge of blood from the organ. This metritis or endometritis is frequently caused by lacerations of the cervix or displacements of the fundus in either a backward or downward direction, which will also keep up the congestion of the tissues. In such a case, the uterus will be found, upon pelvic examination, to be retroverted and low and to be extremely hard. The walls are thickened, producing an enlargement of the organ. At times, this goes on to a greatly exaggerated development of fibrous tissue in the organ, giving rise to the so-called "fibrous uterus." The cervix is hard and may have excoriations on the surface, which may bleed on irritation. Much benefit will result from conscientious and persistent local treatment, seeking to elevate and deplete the organ and so cause absorption of the pathological elements. Even if one decides to operate on the cervix at some future time, this treatment will render the parts much more pliable and will produce a better result. Some practitioners are inclined to rather scoff at this method and make little of it, but they will usually be found to be men who have not carried it out correctly, as it requires both time and patience on the part of the physician and patient. It will, however, almost work miracles at times. The patient requires three treatments a week. These consist in exposing the cervix and fornices by means of a speculum and wiping away all discharges from the exposed areas, to which Churchill's tincture of iodine is thoroughly applied. A small tampon, saturated with boroglyceride, is inserted as high as possible and held there while the speculum is withdrawn. This tampon is retained for about thirty-six hours, when it is withdrawn and a warm douche, of at least two quarts of any mild antiseptic, is taken in the recumbent position and with the douche-can not more than three feet above the level of the patient, as what is required is the prolonged application of moist heat to the pelvis through the vaginal roof. The douche is repeated the next morning and the patient returns for a repetition of the former treatment. These applications ought to be continued for at least one month before despairing of their efficacy, at the end of which time a curettage, with or without further surgical measures, may be done. During the treatment, the patient should abstain from all causes of pelvic congestion, such as sexual intercourse, constipation, etc.

Time does not permit of consideration of uterine bleeding during the later stages of ordinary intra-uterine pregnancy but threatened and inevitable abortions come quite within the scope of this paper, the differentiation of the simply threatened abortion from one which cannot be prevented and the appropriate treatment of each being of the highest importance. When a woman who is, for example, three months pregnant sends for her physician who finds that she is having a loss of blood from the uterus, what is he to do? First, is the abortion preventable? If she is losing a large amount of blood, is suffering from rhythmic pains and has a dilated external os, there is little hope of saving the ovum. In such a case, the best treatment is to pack the vagina thoroughly with strips of gauze under the very strictest aseptic precautions, and by "packing" is meant *packing*, not simply placing one or two strips of gauze loosely in the vagina. Commencing with the posterior fornix, fill that and then place folds all around and over the cervix, filling every part of the passage so that pressure on the urethra at times necessitates catheterisation of the patient. This pressure will not injure the urethra on account of the natural elasticity of the gauze. It frequently follows that pains are set up in from twelve to eighteen hours and the whole ovum will be found on top of the gauze when this is removed. The administration of ½ cc. of pituitrin, injected intra-muscularly, is often useful, or else some preparation of ergot may be tried. Repetition of this treatment two or three times, with twenty-four hours' interval, may be necessary before the desired effect is produced. If this fails, dilate the cervix and remove the ovum with the finger, after which the membranes may be gently scraped away by means of gauze on a forceps, finally giving an intra-uterine douche of any mild antiseptic. If there is any uterine sepsis and the abortion is incomplete and accompanied by a foul discharge, the following is a good example of the method to be recommended. The patient was a married woman, thirty-six years old, seen on October 1, 1921. One period had been missed and she had only flowed slightly for one day during the previous one. She had no idea that she was pregnant. Ten days after the period was due, she began to flow and continued to do so until coming under observation. On admission to a private ward in the Montreal General Hospital, her temperature was 103, pulse 120 and her respirations were 18 to the minute. She had experienced several chills during the day. Examination revealed slight tenderness over the right uterine cornu and a foul blood stained discharge. The cervix was patulous and the fundus the size of a three months pregnancy, very flabby and soft and retroflexed. The vagina was packed and the patient placed in the Fowler's position in bed with ice on the lower abdomen. Next morning the packing was removed and an antiseptic vaginal douche given. No change in the condition of the cervix was discovered, so the packing was renewed. Her temperature and pulse had improved. The same line of treatment was carried out on the 5th, but, as there was no change on the following day, the cervix was carefully dilated and the uterine cavity douched with a solution of formaline, 1-5000, the fluid, aided by stretching the cervix by ovum forceps, bringing away considerable detritus. The interior of the uterus was wiped clean by means of absorbent cotton on forceps, the cavity explored by the finger and a small intra-uterine douche, at 115, was given to produce contraction of the uterine muscle. This was further encouraged by bimanual massage and intra-muscular injection of pituitin. These measures proved effective. The patient's pulse and temperature became normal the next day and remained so until her discharge from the hospital. Where, on the contrary, the haemorrhage is slight, and the pains feeble one may prevent further trouble by rest in bed and absolute quiet, giving mild sedatives, such as heroin, gr. 1-10 hypodermically as required. If the fundus is retroposed, replace it and retain it in position for three or four months, until the uterus has risen out of the pelvis, by means of a pessary, which, if properly fitted, will not interfere with the gestation.

As a woman advances in years, a correct diagnosis becomes increasingly important, as she is most prone to have malignant disease of the cervix or fundus between the ages of thirty-five and forty-five, and therefore all women at that time of life, who come complaining of haemorrhage, even the slightest, from the genital tract, ought to be most carefully examined as to the condition of the pelvic organs. This is especially true after the menopause has become regularly established. The specialist so frequently sees women who have suffered from genital haemorrhage for months and whose medical attendant has failed to examine the condition of the pelvic organs, simply because it was repugnant to the patient. By this neglect, he often fails to recognise malignancy until it is too late to hope for any permanent relief and so incurs a most heavy responsibility.

The two most common causes of uterine haemorrhage at this age, i.e. between thirty-five and forty-five, are carcinoma and fibroid tumours, and the character of the discharge in appearance, duration, onset and mode of cessation will often be of the greatest help in coming to a conclusion as to the malady from which the patient is suffering. In fibroids, the blood comes from the vessels of the endometrium and is due to increased congestion. Consequently, it appears gradually, is fairly dark in colour and ceases gradually, as the degree of ovarian stimulation rises and wanes. In cancer, however, it is due to actual destruction of tissues by advance of the disease. The vessel wall is perforated, suddenly setting free a jet of bright red blood if the vessel is an artery, or darker if a vein has been attacked. This bleeding goes on until the entire circumference of the vessel wall has been destroyed, allowing the coats to retract and so assist the blood to coagulate and close the opening. If the patient has a fibroid with haemorrhage, this excessive bleeding manifests itself first simply as an excessive flow at the period, which becomes more profuse and prolonged as time goes on. In malignancy, on the contrary, it appears irrespective of menstruation whenever a vessel is eroded. A typical history obtained from a patient with uterine cancer is that she has been perfectly regular up to her last period, but that lately she has noticed a slight spot of blood at the vaginal orifice after her marital relations or she has been to the closet. Or the same symptom may be noticed after the menopause has been established for months or years. In such cases as these, a local examination of the pelvic organs will usually reveal the presence of a small patch of ulceration or a hard nodule, over which the mucosa is reddened, on the cervix. Of course, if the disease is located inside the body of the uterus no local manifestation will be seen or felt. Where there is an excoriated patch on the mucosa covering the cervix, it must be borne in mind that it may be due to simple, non-malignant inflammation. The diagnosis can be made in one of two ways. The first, and much the best, is to take a section right through the whole thickness of the cervix and have it examined by an expert pathologist. The other is to treat the condition locally by the application of iodine, the insertion of tampons and the use of a douche. If the cause is inflammation, it will clear up or, at least, show some improvement in ten days or two weeks, whereas if carcinoma is present but little change will be effected.

Finally, elderly women frequently have minute haemorrhages from either the vagina or uterus. simply from the fine arterioles breaking down, One may be able to feel or see absolutely nothing, in which case the condition will soon clear up under hot douching with some styptic solution, together with the administration of small doses of ergot.

There is one more instance of uterine haemorrhage which deserves notice. A woman has been delivered of a full term child or, more likely, of an hydatid mole. Nothing particular is noticed at the time of labour but, shortly after delivery, the woman complains of vaginal haemorrhage. You examine the vagina, cervix and fundus and can make out nothing more than some enlargement of the uterus. The bleeding withstands all forms of medication and you are driven to use the curette, which brings away but little tissue. The haemorrhage is checked for, possibly, a couple of weeks but then returns and you are again forced to curette. The scrapings are examined and the pathologist reports that there are no signs of malignancy in the specimens. Again there is a recurrence of blood-loss and now the woman shows signs of failing health. The above history is typical of chorio-epithelioma and the quicker the uterus is removed the better it will be for the patient.

The following cases may prove of interest as illustrating some of the above conditions.

1. Mrs. S. aged 41 years,a unipara, was admitted to hospital on February 29th., 1921, complaining that she had suffered from a watery discharge from the genitals, brownish in colour, since the previous November. Her sexual history was negative, the periods being regular and her one labour was natural. Her general health was good and there was no sign of any cachexia. Her mother had died of "cancer of the face." Local pelvic examination revealed the presence of a thin watery discharge and a cauliflower mass attached to the cervix. The fundus felt healthy and the uterus was freely movable. The whole uterus was removed through an abdominal incision, a ring of vaginal wall being closed over the cervix by right angled clamps before the vagina was cut into. The specimen removed showed that the cancer had spread upwards to just beyond the internal os and that it was surrounded on all sides by healthy tissue, thus holding out a good prospect of a permanent cure.

2. The next case reveals a tragedy. Mme. St. M., aged 30 years, was first seen on May 16th, 1920, at which time she complained that she had lost a little blood each day for the past three months. For the last two months she had felt pain in the left leg and inguinal region, especially when she attempted to lie on that side. There had been some loss of flesh.

In the previous November, i.e. about seven months before admission, she was delivered naturally of a full term child and made a good recovery.

Her first period after confinement was at the end of January and was preceded by a white discharge. She menstruated regularly in February and March, but lost a little blood every day between the periods. Her family history was negative as regards cancer. The patient was a large, well nourished woman but was pale, and cachectic. Examination of the genitals showed the perineum to be lacerated and to be bathed with a reddish discharge which had a slightly disagreeable odour. The cervix was very bulky, filling the whole upper part of the vagina and inclining to the left. Its surface was rough and broke down easily under manipulation.

Of course there was no difficulty in diagnosing the case as one of epithelilma of the cervix which had spread too far to justify any attempt at removal, but the diseased area was very thoroughly cauterised and the patient was sent home in four weeks. She died six weeks later.

This woman had been confined in a small country village and had not been examined by her physician after labour. It is very doubtful if anything would have been discovered if she had been, as the disease at that time was probably very embryonic. It was a very rapidly growing type of cancer and her youth, 30 years of age, coupled with the uterine congestion consequent upon pregnancy would favour the extremely rapid spread.

The next two cases present similar signs and symptoms but the causes were vastly different.

3. Miss C., aged 67 years, was first seen on February 24th., 1921. At that time, she complained that there had been a pinkish uterine discharge for the previous six months but that there had been no disagreeable odour at any time. She had not suffered any pain and, although she was very tall and thin, there had been no loss of flesh. Her skin was pale but she looked as if she never had much colour and she informed me that such had been the case. There was nothing the matter with her heart, lungs, liver or kidneys and she had no cancerous family history. The hymen was present, the orifice being very small. The fundus was felt, per rectum, to also be small and a diagnosis of a small intra-uterine polyp was made. The patient was curetted the day after admission and the diagnosis was confirmed by the removal of three tumours, but I regret to say that they were not submitted to microscopic examination. The discharge returned soon after going home and continued until her re-admission on September 22nd of the same year. There still was no odour, pain, loss of flesh or cachexia but it was determined to remove the uterus, which was done through an incision in the anterior abdominal wall. On cutting it open, the organ was found to contain some broken down tissue stained with blood and at the upper part of the anterior wall, and spreading towards the right, was an area of undoubted cancer.

The following is the report on the uterus of Miss C., of Dr. J. L. Rhea, who kindly reported on all of these cases for me.

The whole uterus measured 8½ cm. in depth, the cervix being a little longer than usual. In the body of the uterus, and projecting into its lumen, is an irregular rounded mass, 5 x 3½ cm., which is elevated above the mucous membrane from 3-8 mm. The margins are slightly overhanging but the edge is well demarkated from the mucosa. The surface is irregular and presents a granular appearance with a varying colour, that predominating being a pale yellow with small pink patches, the latter marking the presence of fine vessels. Section shows the wall to be deeply infiltrated with cancer cells but none have reached the peritoneal covering cf the uterus. Outside of the larger mass, and separated from it by an area of smooth and apparently healthy mucous membrane, is a smaller mass of similar tissue and appearance, measuring 1.5 cm. by 8 mm. This is a rare condition, being evidently a nodule of cancer implanted secondarily from the first.

4. Miss S., aged 55, was first seen in January 1920. She had been losing a little blood stained discharge since the previous September. There was neither cachexia nor loss of flesh but the discharge had a slightly disagreeable odour. Her mother had died of cancer, the location of which was not known, and she had been in one of the wards of the Montreal General Hospital in 1914, where she had been treated for disease of the heart and kidneys, this latter being quite enough to account for her uterine haemorrhage, so she was advised to rest and to take hot douches and tonics. She was seen periodically off and on until January 1921, her general health and local condition remaining the same. The uterus was then removed, she made a perfect recovery and is now in such good health that she wishes to resume her occupation as nurse, which her ill-health had compelled her to relinquish several years ago. Examination of the interior of the uterus revealed a small fibroid polypus attached to the fundus. This growth was surrounded by a small area of ragged looking tissue, which was pronounced by Dr. Rhea to be benign.

Case Reports

NEPHROLITHIASIS, PYONEPHROSIS AND IMPACTED URETHRAL CALCULUS IN A BOY FOUR YEARS OF AGE

Hosp. No. 4051-21.

W. C., a male 4 years of age, entered the Montreal General Hospital in the surgical service with a history of prolapse of the anus. His past history was irrelevant. There was during defecation a slight prolapse of the anus, but what was more important, a difficulty in urination without frequency. Soon after entering the hospital, urination became painful and the child pulled at his penis during the act. Acute retention soon developed necessitating catheterization. It was noted that in the membranous portion of the urethra the catheter met with some obstruction. The bladder, however was emptied. Examination at this time showed a palpable, hard mass at the peno-scrotal junction. This was also shown by X-ray and at the same time a diagnosis of multiple stones in the pelvis of left kidney was made. Three days later, he again developed acute retention. This time it was impossible to insert the catheter into the bladder on account of the stone impacted in the membranous portion of the urethra. This was removed surgically. Recovery was uneventful. Pus and albumin in his urine, which had been found at the first examination, continued and on catheterization of the ureters it was found that urine from the right ureter was normal while that from the left was turbid, acid, showed albumin, pus and masses of epithelium. A nephrotomy was performed. After the kidney was cut down upon an attempt was made to remove the stones through a pyelotomy incision, with the hope that the kidney might be saved, but some of the stones projected so deeply into the kidney substance and this organ showed such marked evidence of degeneration, it was thought advisable to remove it. Recovery was uneventful.

Stones in the *kidney* at this age are uncommon; stone in the *urethra* still more uncommon. The urethral stone no doubt came originally from the kidney. Reaching the bladder, it increased in size and finally passed into and blocked the urethra. This case furthermore illustrates the ease with which complete urological examination, including ureteral catheterization, can be conducted in young children.

H. C. Cassidy, M.D.,
Senior House Surgeon

A CASE OF ANUS VESTIBULARIS; RECONSTRUCTION WITH SUCCESSFUL RESULT

R. O'Callaghan, M.D.

Calgary

Female patient. Age 9. Born in England. At birth it was noticed that baby had no anal orifice. Over the site of the anus was a small tumour growth. Further examination revealed a small fistulous opening in the lower end of the vestibule. After consultation, it was thought advisable to wait until later if no serious symptoms arose.

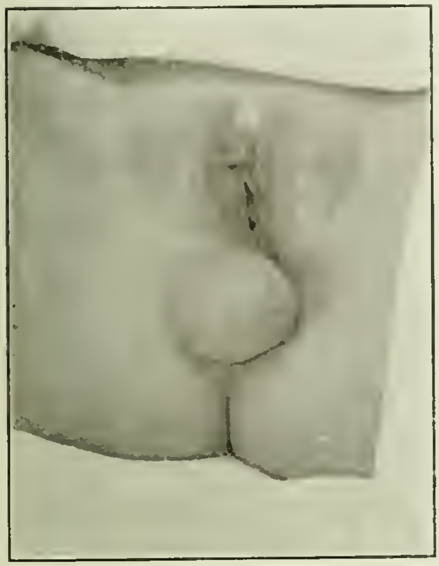
The mother moved her residence and since that time, nine years ago, the child has had no attention. The bowels have never moved normally. About once a month she would have a desire to defaecate and would roll on the floor in great pain. The mother would support abdomen and back, and with great pain and straining the girl would pass hard pencil shaped faeces.

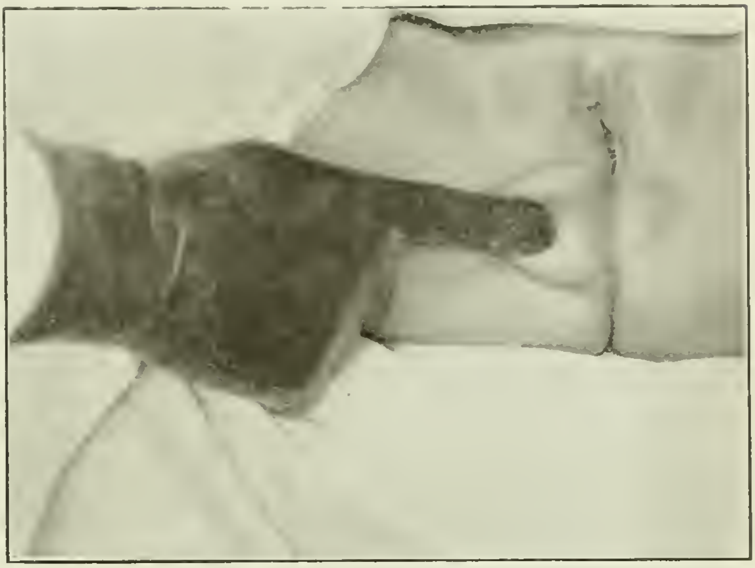
Of late the abdomen has been getting larger and the attacks of pain more frequent; while the passing of faecal matter took place at longer intervals and with greater pain. Recently she has had symptoms of partial obstruction, vomiting, pain and fever.

Examination. A fairly well nourished female child 9 years old. Heart, lungs and kidneys were normal. Abdomen enormously distended, symmetrical. On palpation a large tumour mass can be felt occupying the middle line from ensiform cartilae to the pubis; it can be moved laterally and is quite tender on manipulation and gives a doughy sensation on touch and appears to be the greatly enlarged and distended colon. Examination in lithotomy position discloses a tumour the size of a hen's egg springing from right buttock close to the natal fold and falling across the mediam line. On holding this back a complete absence of the anus is seen. The condition was one of Anus Vestibularis, the opening being so small that it would not admit a lead pencil. X-Rays were taken following a small Bismuth meal and showed a greatly enlarged colon. The tumour was diagnosed as a lipoma and found to be such at operation.

Operation. The tumour was removed and the anal orifice was dilated until a finger could be admitted. The great mass of faeces could then be felt smooth and hard. This was gradually broken up with the small finger and spoon.

Following this the bowel was irrigated and more of the mass softened and washed away. The original plan was to move the whole orifice down to its proper level but as there was good sphincter action in anterior or upper wall it was decided to leave the same intact. Splitting the perineum from posterior wall well down towards the coccyx and dissecting free this wall it was brought down and fixed to the skin margin. The child six months later was in excellent health, her bowel movements daily with complete control indicating that colon was evidently getting back its lost tone.





This case is interesting owing to the following facts:

1. That for nine years a proper bowel evacuation had never occurred.
2. The enormous dilatation of the whole colon.
3. The slow onset of obstruction.
4. The complete relief and sphincter control gained in the re-constructed anus.

Prostatectomy in Bad Surgical Risks.—Old age, according to H. G. Bugbee, New York (Jour. Amer. Med. Assoc., September 17, 1921) is not, in itself, a contraindication to operation, and has probably been overestimated as a risk. Even in the presence of advanced cardiac and renal complications, prostatectomy may be carried out with success by a step-by-step process, improving the local condition of the urinary organs with each step, and giving much attention to the patient's general condition as one progresses. Hæmorrhage should be avoided at the enucleation of the prostate, much of the shock and renal insufficiency being thus prevented. The mortality resulting from such a procedure will be slight. Pulmonary embolus is always a possibility, and probably a more frequent occurrence than after most other types of operation.

Retrospect

THE PROBLEM OF THE CONTROL OF DIPHTHERIA

H. B. Cushing, M.D.

Attending Physician to the Alexandra Hospital

Montreal

Towards the close of the last century the discoveries of the diphtheria bacillus and of the value of diphtheria antitoxin for treatment and prophylaxis led to a widespread hope that the most dreaded disease of infancy had lost its terrors and in future would be entirely controlled. For a few years it looked as if this hope might be realized; there was a diminution in the total mortality from diphtheria to a half of the former rate and then to a quarter. By means of cultures it became possible to diagnose the disease with certainty within twelve hours; serum cured practically all cases if given in time and prevented further spread of the infection if given in prophylactic doses. Diphtheria appeared to be conquered and destined to be stamped out in all civilized communities.

After a number of years, however, it became evident that this optimism was not justified. The number of deaths from diphtheria in any country where accurate records were kept remained remarkably constant. Diphtheria still remained the third most important cause of death from contagious diseases. The morbidity of the disease was not changed, the same number of cases per 100,000 of the population occurred year after year, (1) and it was increasingly evident that, in spite of the great advances made, some new method must be introduced if the disease were to be actually controlled. In spite of improved registration and quarantine, in spite of isolation hospitals, in spite of free antitoxin and state laboratories for bacteriological tests, an apparently irreducible minimum of cases remained in every country with a death-rate of disheartening proportions; e.g. in the United States about 12,000 deaths a year were due to this disease.

This was the position of the question when Schick published in 1913 (2) an account of the cutaneous reaction which has since borne his name. This test stands alone among immunological reactions. It is not a test for the existence of the disease, but for the degree of immunity existing in the individual. Regarded at first as a curiosity or a matter of academic interest to investigators, it has gradually assumed a greater importance, until now it again gives us hope that the former optimistic belief may be realized and diphtheria finally controlled through the use of this reaction when combined with Behring's method of toxin-antitoxin immunization.

The details of the technique of the Schick reaction are practically unaltered since the original description by Schick. The various publications of W. H. Park (3) and A. Zingher (4) describe it in detail. 1-50 of the minimum lethal dose of diphtheria toxin for a 250 gm. guinea-pig diluted with 0.2 cc. of normal saline are injected intracutaneously and in 48 hours the reaction is seen at its maximum as a reddened and infiltrated zone of 10-25 mm. diameter, followed in a few days by pigmentation and a slight desquamation. The chief difficulties encountered have been, first, in the securing of a reliable standard toxin which has not lost its virulence by warmth or exposure; and, second, in the occurrence of pseudo-reactions, which can be excluded by suitable controls and by experience in the appearance of the typical reaction.

The results of the Schick test as given by various writers from their experience on many thousands of cases are practically identical. For example, all but 20% of children under 6 months of age are found to be immune, 70% of children between 1 and 3 years are found to be susceptible, i.e. give a positive reaction; after 3 years of age the proportion of positive reactions gradually falls until in adult life only 15% give a positive reaction. A dose of 1000 units of diphtheria antitoxin causes the reaction to become negative immediately but this immunity passes off in about three weeks. The toxin-antitoxin immunization takes about six weeks to produce a negative test, but practically all cases are still negative at the end of a year.

The revolutionary suggestion has been made by Park and others that it should be possible to test the whole population, or at least all school children and permanently immunize all that were found susceptible, thus finally eradicating the disease. An endeavour has been made to carry out this suggestion in various parts of the United States on a large scale. (6)

When we turn to the consideration of the question on the other side of the Atlantic, we find they are by no means prepared to accept the enthusiastic schemes of the Americans. The French Society of Paediatrics recently drew up a series of recommendations for combating diphtheria (7); in these both the Schick reaction and toxin-antitoxin prophylaxis were deliberately excluded, the former on the ground that there was no proof that it indicates an absolute immunity, and the latter because of the length of time required to produce immunity. Martin, (8) at a meeting last April of the Societé Medicale des Hopitaux de Paris, expressed the opinion that the Schick reaction, although very interesting from the biological and immunological points of view, should not be included in routine prophylactic work.

In England the Ministry of Health has issued a report of methods of prophylaxis by Dr. S. M. Copeman, F. R. S.; (9) this describes in detail the Schick reaction and toxin-antitoxin immunity but concludes that "more information and experience would be necessary before this could be recommended, and it would be neessary to be satisfied that equally good results cannot be obtained by extension and improvement of the methods of diphtheria prevention on which we rely at present."

In conclusion, it has been established that, when properly performed, the Schick reaction is a thoroughly reliable test of susceptibility to diphtheria. Having by its means detected the non-immune portion of a community, it is possible to protect these persons by active immunization. Therefore it is now possible for any civilized community to protect itself absolutely and permanently against the disease. Whether, in view of the difficulties of government control of hygienic measures and the peculiarities of human nature, this is practicable as well as theoretically possible remains to be seen.

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THE PARKINSONIAN SYNDROME

(PART TWO)

COLIN RUSSELL, M.D.

The cause of Parkinson's disease is often impossible to determine. Patients frequently blame an emotion. With regard to this, it is necessary to distinguish between acute emotions and the chronic emotions. Fright is most commonly blamed. Potain on this account speaks of paralysis agitans as a fixed fear. In spite of this, it does not seem possible that fright, however vivid, can produce tremor of the Parkinson type. The time intervening between the emotion and the appearance of the tremor is not always indicated. Further, authors are dependent upon the story of the patient, or his friends, that is to say, an old memory, and not very precise. One is convinced, in all these cases, the emotions simply emphasize a mild tremor formerly present at times, at others, more or less latent and unperceived. One cannot conceive an emotion due to a tremor localized to one limb, and if it were possible to conceive of this, one cannot say why without a new emotion it could generalize itself after some months or even years to an homologous limb, or to the opposite side. Medical officers with years experience have never or very seldom discovered tremor of Parkinson's disease among the soldiers. Numerous cases of paralysis agitans have been observed who blamed their disease upon strong emotions, bombardment of fire, but after close questioning one is convinced that this was not the case.

As for traumatism, among many wounds or contusions of periphereal nerves that have been seen during the war, a long time after the receipt of the wound, not a single case of Parkinson's disease has been observed.

We come now to the cases which appear best established, and to which we can attach a little more interest, namely, the infections. The recent epidemic of encephalitis lethargica which produced so many cases of the Parkinsonian syndrome has drawn our attention to the etiological role of the infectious diseases. Previous to this, the disease as a consequence of infection was ignored or systematically neglected. In 1846, Romberg published a case of paralysis agitans following lead poisoning. Leroux, in 1880, quoted a similar case. Crespin and Bernhardt reported one following measles. Vesselle and Rouvillois, one following acute rheumatism. In 1893, Gowers declared that Parkinson's disease could follow dysentry and typhoid fever. Among all these cases, I will choose two very satisfactory ones. Lannois has observed a child of 12 years old who, after measles, presented a Parkinsonian syndrome, and who, six years later, had typical paralysis agitans with rigidity, tremor, trembling, sensation of heat and exaggerated perspirations. The observations of Franck R. Fry concerning a man of 37 years who, in the 4th week of typhoid fever was affected with a Parkinson tremor which little by little affected the upper limbs then the lower. Three years later he presented all the signs of paralysis agitans. Encephalitis lethargica has given rise in the last three or four years to a great number of such cases. Souques has himself seen 26 such cases.

Dana, in 1899, insisted strongly on the etiological role of the infections and intoxications. For him, most cases are of this origin. The infection and intoxication produce changes in the nerve cells which degenerate slowly. In spite of this degeneration they carry on often during many years, but there comes a day when these damaged cells finish by dying and it is then that paralysis agitans appears.

Syphilis is not an etiological factor.

Besides the infections and intoxications it is necessary to consider cerebral arteriosclerosis. The frequency, at autopsy, of atheroma of the circle of Willis and its branches, explains why this cause is considered seriously. Besides this clinical consideration, paralysis agitans usually appears in the second half of life and has a slow evolution, which coincides with the appearance and the progressive character of arterial changes. These changes diminish the calibre and the elasticity of the vessels, and by impaired nutrition may cause a slow degeneration of the nerve cells. Some authors consider cerebral arteriosclerosis as the only cause of Parkinson's disease. But the role of cerebral arteriosclerosis is difficult to accept in cases of juvenile paralysis agitans and besides numerous authors, Hunt and Tretiakoff in particular, have not found very marked lesions of this nature in the corpus striatum or the peduncle. Parkinson's disease does not as a rule show an arterial hypertension. In fact, new researches are necessary to prove the etiological role of cerebral arteriosclerosis in the determination of Parkinson's disease. Certainly it is perfectly possible and admissible.

There are some special cases where arterial changes appear to be the cause; those causes with destructive lesions, lacunae, softening or haemorrhages in the striate region already mentioned.

Sex and race have no influence in the disease. It usually comes on between 40 and 60 years of age. One has noticed a similar heredity, but it is too rare to justify any conclusions.

SYMPTOMS OF THE PARKINSONIAN SYNDROME

The symptoms of this disease are too generally well known to require description in detail. They are: tremor, muscular rigidity, abolition of automatic and associated movements, vaso-motor disturbances. As the disease goes on, these symptoms interfere with the execution of ordinary voluntary movements until finally these become limited and exhausting. The retardation of movement is most striking; when the patient is ordered to execute the most simple acts, minutes may elapse before the movement is initiated. Both static and dynamic activity of the muscles is diminished, producing a peculiar facies and the characteristic attitude of the head, trunk, limbs and spine. The freedom of movement of the eyes is in striking contrast with the immobility of the head. One of the rarer symptoms is what Tilney of New York, in 1911, described under the name of "progression meladromique," but which Souques prefers to call "paradoxic kinesia." Patients who could hardly make a few steps were at times able to run. Another who was unable to make any movement, or even lift a limb, could at times cross his knees spontaneously, or on command.

with one single movement of normal rapidity. When this patient wanted to talk he found it impossible to open his mouth. When he was asked a question, it would take him sometimes five minutes or more to answer. On one occassion, although he tried to talk, he could not utter a word for fully an hour. Occasionally, however, this same individual would be able to speak easily without the slightest effort. No explanation has been given for this curious phenomenon.

Clinical Forms of Parkinsonian Syndrome

One recalls three principle forms of Parkinson's disease:-

1.—The typical form—a mixture of tremor and rigidity, involving all parts equally.

2.—A "forme fruste" with tremor with little or no rigidity. It is striking an account of the absence of the characteristic attitude.

3.—A "forme fruste" with rigidity but little or no tremor.

Besides these well known classical forms, it is necessary to note other types in which the age at the time of onset, or the peculiar nature of the case presents special features.

1.—The pre-senile or senile Parkinson syndrome, this is the classical paralysis agitans, which has served as a model for the descriptions of all types. It appears about the age of 40, insidiously, without determinable cause, and progresses slowly. Besides this typical form, one may observe two incomplete types; the one with the absence of rigidity, and the other with the absence of tremor.

2.—The juvenile Parkinson syndrome appearing before the age of 30, sometimes hereditary. The evolution of this type is apt to be more rapid, the bulbar muscles are more often affected than in the senile type, but there is in reality no reason to separate these two forms.

3.—Parkinson syndromes with pre-senile lesions of the corpus striatum. In these cases the tremor is absent, but clinically it is impossible to differentiate between this and the "forme fruste" of the classical paralysis agitans mentioned above. Autopsy shows neuroglial proliferation of the entire corpus striatum, and calcification of the striate arteries.

4.—Parkinson syndromes with focal macroscopic lesions. It is often difficult to differentiate this syndrome from the classical type except that the onset usually is acute and may follow a stroke. Autopsy reveals the presence of lacunae in the corpus striatum.

5.—Parkinson syndromes following encephalitis lethargica. Such cases have been noted in the literature of all countries, and the absolute resemblance with Parkinson's disease has been mentioned by all. Unquestionably, encephalitis lethargica is one of the causes of paralysis agitans. The lesions of encephalitis, although later becoming diffused, attack principally the mesocephalon and the central ganglia. Precisely at that level the best carried out researches have localized the lesion of Parkinson's disease.

The Parkinson syndrome is apt to appear in severe and moderately severe cases of encephalitis where the oculo-lethargic symptoms have been marked, and first appears as these are clearing up. Souques, basing his observations on some 60 cases from his clinic and the literature shows that most of them occur during the first half of life. As a general rule the symptoms appear during the first month of encephalitis. The onset is generally rapid; muscular rigidity is the chief symptom. The tremor is slight and frequently transient; in some cases, the emotional disturbances, exhaustion and the voluntary movements are very marked. In two thirds of the cases the onset was with rigidity alone, or associated with tremor, the latter was absent in one-third of the cases. More often the tremor and rigidity became generalized at once. This is almost never seen in classical paralysis agitans. In one-third of the cases it was monoplegic or hemiplegic at the onset. The cerebrospinal fluid showed no lymphocytesis nor increased globulin. Not infrequently the Parkinson syndrome disappeared in the course of a few months, but Souques believes that where, following encephalitis, it still persists after two or three years, it is then to be considered definite paralysis agitans.

Diagnosis of Parkinsonian Syndrome

It is practically only in very early cases or in undeveloped cases that an error of diagnosis is likely. Even when the tremor is present as a more or less isolated symptom it is rare for the diagnosis to present any real difficulty. Hereditary or family tremors, the tremor of Basedow's disease, hysterical tremors, or toxic tremors can be differentiated by the character of the tremor itself and the concomitant phenomena. There is no such thing as a senile tremor, according to Souques. Sometimes in paralysis agitans the tremor is intentional for a longer or shorter period, and one might in this case think of disseminated sclerosis, but the concomitant signs, the presence of Babinski's plantar phenomenon will easily make the differentiation.

In cases where the rigidity exists as an isolated symptom, the Parkinson disease may be confounded with the pseudo bulbar paralysis or the paresis of old people due to what Pierre Marie has described as "l'etat lacunaire de desintegration" affecting the internal capsule, which presents an inexpressionless facies, a speech monotonous and difficult to understand, progression with short steps on a wide base and the stiffness of the limbs. The existence, however, of exaggerated reflexes with clonus or Babinski's sign, of spasmodic laughter and crying, and mental involvement, generally clear up any difficulty. The history of one or more slight apoplectic strokes is also very important.

TREATMENT OF THE PARKINSONIAN SYNDROME

There is naturally no specific or curative treatment. Palliative treatment may be medical or physical. Opotherapy has proved useless. Good results are usually obtained by the administration, either by mouth or hypodermic injection, of scopolamin, hyoscine, atropine or eserin, given in small doses, care being taken to avoid the toxic effect. Arsenic in large doses, especially cacodylate of soda, has been employed to lessen contractures; the results, however, have been disappointing. the contractures being diminished, but the cerebral excitation being proportionately increased. Physical agents such as hydrotherapy, mobilization of the joint, massage and keeping the patient in a "fauteuil trepidant" are recommended for alleviation of the symptoms.

A Plea for the Metric System.—For years the problem of introducing the metric system into general use in this country has occupied the interest of physicians as well as of other scientists. This system is today employed in all the civilized world except Great Britain and her colonies, Russia and the United States. Even Russia, before the outbreak of the war, calculated all her imports according to the metric system. The present time seems to be distinctly opportune for a renewed agitation in the United States for adopting the system. Two million American soldiers received some instruction in its use during their sojourn in France; many of our industrial plants became familiar with the metric scale through work on war material designated for shipment abroad., and the wiping out of international borders is today more closely realized than ever before in the world's history. At its last meeting, a committee of the American Chemical Society recommended the general adoption of the metric scale and requested that chemists hereafter order all supplies in metric quantities. A resolution favoring the method was introduced into the House of Delegates of the American Medical Association, at the Boston session. As one hears of the numerous organizations cited as being wholly favourable to discarding the old methods and to replacing them by the metric, one wonders how it is that the change has not long since been made. The medical profession should take the lead and not follow in this reform. If it is to do this, the first step must be education of the young men. Teachers in medical colleges should teach in terms of the metric system and talk in terms of the metric system at the bedside as well as in the lecture room. To stop at this, however, would be slow work. It is necessary that medical journals, too, should feel their responsibility in this matter. If authors who submit manuscripts do not give measurements in metric terms, the periodicals may aid the movement by making the necessary transposition.—*Jour. A.M.A.*, October 15, 1921

Editorial

ON THE DANGER OF EX-SERVICE MEN WITH NO MEDICAL KNOWLEDGE ATTEMPTING OSTEOPATHY OR SO-CALLED CHIROPRAXIS

IN no spirit of envy or malice against the cult of Chiropraxis, but in a very sincere appreciation of the dangers to which its practice exposes a public, easily imposed upon by plausible doctrines, we desire to express our great regret that a Minister of the Federal Government, a graduate of one of our old universities should have succumbed to the arguments or blandishments of uneducated poseurs, and should have recognized in any degree this cult. This feeling will be shared by all who appreciate the value of knowledge and who know that our bodies are fearfully and wonderfully made, and have experienced how frequently ignorance aggravates trouble. In a morning paper we noted three cases reported in which death had resulted under chiropractic treatment: cases in which humanly speaking life might have been saved by knowledge and skilful surgery. It is with such facts in mind that we desire to call the attention of our readers to the letter from the Chairman and Secretary of the Executive Committee of the Canadian Medical Association to the Minister of Health in Ottawa.

Since writing the above we have received a reply from the Hon. Dr. Beland, and we desire to express appreciation of the promptness with which Dr. Beland has recognized the unfortunate condition which would arise from uneducated men attempting to treat disabled soldiers.

ON THE TREATMENT OF THE TUBERCULOUS EX-SERVICE MAN.

THE two reports* recently published by the Department of Soldiers' Civil Re-establishment on Tuberculosis affecting ex-members of the Canadian and Imperial Forces in Canada show that this important subject has received the serious consideration of the Government.

In 1920, a Board of five sanatorium physicians, senior men in this field in their respective provinces, visited the twenty-seven sanatoria and hospitals in which tuberculosis was specially treated. They were instructed to study the whole question of tuberculosis in relation to ex-service men both as regards the present and the future and to report their observations and conclusions in detail.

It is a satisfaction to learn that "Canadians may feel assured that their fellow-country men who have given war service and who are now tuberculous are being cared for by physicians competent and experienced, in institutions specially developed for their needs of which the country may well be proud."

By April, 1920, 8,571 tuberculous patients had been treated by the Department. The rate of development of new cases was then declining. This harvest from war (double what should normally be expected from a similar number of men of military age) threw a heavy strain on the limited facilities for treatment available at the beginning of 1916, and the slow turn-over of patients intensified the strain until new construction was able to meet the need.

The Government immediately undertook not only a rapid development of most of the existing sanatoria but also the construction of new institutions to meet this need, so that the sanatorium accommodation was more than doubled by the end of 1919, when 3,800 beds were available for soldiers and civilians. All provinces received due consideration. More than seventy new buildings were erected and many existing buildings enlarged. While most of these were admirably constructed for their special purpose, some few institutions, improvised in time of need, were found not to be entirely satisfactory. These were closed as soon as the patients could be transferred. Under the circumstances criticisms and complaints from both patients and public were at times inevitable. It is noteworthy that 72% of the complaints of 1,530 patients visited were massed in two institutions, proof that reasons for complaint elsewhere were few. Sanatorium life proved to be most irksome to many ex-service men whose previous military life had in every way been subversive of the constant restraint necessary for the successful treatment of tuberculosis. It is, therefore, not surprising that disciplinary difficulties, often a serious handicap to efficient treatment, were frequent, especially in the earlier years.

The participation of the Federal Government in sanatorium development was a result of the war which has already benefitted the public at large. No decade of peace could have effected so much for the treatment of tuberculosis. All the sanatoria with their excellent diagnostic facilities, including laboratories and X-ray departments, may, if properly preserved and developed, now become diagnostic centres in their communities. The sanatoria were in many instances under-staffed medically. This is ascribed in part to the difficulty of obtaining physicians interested in tuberculosis, but it may be surmised that if the directors of sanatoria had the will to have their institutions well-staffed physicians could be obtained. Tuberculosis can no longer be regarded as a restricted field but one with which all branches of medicine are intimately associated.

The statistical studies on such a large group of cases (8,571) are of interest and value. Throughout the period of the war it is calculated that 4.3 men developed tuberculosis each year for every 1000 under arms. Forty-four per cent. of these had positive sputum. A much larger proportion, therefore, were less certainly tuberculous than has hitherto been the case in civilian sanatoria where about seventy per cent have positive sputum. Broadly speaking, there was found to be twice as much so-called tuberculosis amongst the ex-service men as amongst civilians of the same age period. In the several provinces the morbidity rate varied directly with the tuberculosis death rate, showing that the tuberculosis in the army was proportionate to that in the civilian population from which the men had been drawn. About 10% of the patients admitted to sanatoria were diagnosed ultimately as non-tuberculous. Poison gas was considered a factor in the development of tuberculosis in only 5% of the patients. The figures for the ex-service men may possibly approach a truer index of the amount of tuberculosis actually developing each year than that estimated for civilian life, since the soldier has been under closer supervision than the civilian.

Not only has the treatment of the tuberculous ex-service man been well managed by the Department but timely assistance and a real and needed stimulus have been given by the Government to the whole anti-tuberculosis work in Canada.

The care and employment of the tuberculous ex-service man after discharge from the sanatorium is now of relatively greater importance than his treatment in efficient sanatoria. Information broadly gathered from the literature, from personal inspection of places in England, the United States and Canada, where practical measures along this line are already in operation, from localities of special interest in Canada and from patients themselves, past and present, is condensed in a wide survey of this problem. The danger of relapse is emphasized and many practical measures for its prevention suggested. A follow-up system by specially qualified nurses, and by adequate medical supervision, are here of first importance. Provision of an opportunity for sheltered employment in varied forms is urged. What form this should take will necessarily depend upon the number of men to be cared for and the locality. Shops with various suitable crafts, industrial colonies, group enterprises where numbers are too few for a colony, and individual assistance are recommended. All who are medically fit to undertake limited work may thus become self-supporting and useful. It is proposed that such undertakings should be carried on by non-Governmental agencies with some financial aid for their establishment and maintenance from the Government. The number of patients who are in the readjustment period after discharge and may either relapse or attain economic rehabilitation, for whom such opportunities should be provided, has been estimated at 4000. The urgency of realizing the general plan suggested is obvious. Some parts have already been put into operation, but little has yet been done in providing sheltered employment. Time passes, and if a strong administrative body cannot be found to undertake the work the Government should itself carry out the measures recommended. This study of the problems of "after-care" (hitherto the weakest point in the treatment of tuberculosis) constitutes the most comprehensive review that has yet been published on the subject.

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*1. Summary of Report of Board of Tuberculosis Consultants, 1920.

2. The Care and Employment of the Tuberculous Ex-service Man after discharge from the Sanatorium, 1921.

THE OCTO CENTENARY OF ST. BARTHOLOMEW'S SCHOOL

THE many physicians practising in Canada who have taken post-graduate studies in London will all have kindly memories of the stately buildings of 'Old Barts' standing in a central position close to famous Smithfields the scene of so many important events in English history. We learn that the hospital is about to celebrate its 800th anniversary. At a meeting held at the Mansion House in London preliminary plans for the celebrating next spring of the anniversary of this, the oldest hospital in London, were made. The Prince of Wales, president of the hospital, has given his cordial approval to the scheme. All universities will be invited to send representatives, and the Lord Mayor will be permanent chairman of the grand committee.

The quaint story of the foundation of St. Bartholomew's by Friar Rahere is told in a charming manner by Sir Norman Moore. Rahere was 'born of lowly race,' but by his wit became first a court jester and later a monk. He made a journey to Rome to obtain forgiveness for all his sins, but on his way back fell ill, and on his sick bed made a vow that if he recovered he would build a hospital for the recovery of the poor. While still unfit to travel, St. Bartholomew appeared to him in a dream and gave him directions for building a priory and outbuilding in Smithfields then 'an unclean field' outside the city walls. His zeal and energy carried the plans through, and in March A.D. 1123 the building was opened and many notable and miraculous cures were obtained in it. The whole story is told in a manuscript called "Liber Fundacionis" written about 1189, and now in the British Museum, of which a very full account with extracts has been given by Sir Norman Moore. The ancient cartulary of the hospital, written in the reign of Henry VI by John Cok, contains a copy of every royal or private charter, and of every Papal Bull belonging to St. Bartholomew's Hospital at that period of the fifteenth century. For the first four hundred years of the institution its character as a religious house was preserved, and it was not until Tudor times that it came into prominence as a place for the treatment of sick people. But even in mediaeval times it had its influence on the course of medicine in the British Isles. From the time of Henry VIII's charter its progress as a great force in the history of medicine was unmistakable. On the ruins of the old order was then raised the great hospital as we know it to-day.

Therapeutical and Pharmaceutical Items

ON STANDARDIZATION

The physician when he administers digitalis to a patient with auricular fibrillation now knows much more accurately than he formerly did what effect he should get. Secondly, he knows that he must often employ doses which verge on toxic ones and that his patient must continue to take a certain number of drops daily to maintain the necessary degree of heart-block. Should the patient obtain a weaker preparation, he will suffer; should he get a much stronger one, he will show symptoms of poisoning. Yet, at present, neither physician nor patient has any guarantee that any tincture he may buy is of a given strength. Tinctures of digitalis assayed pharmacologically in this province have varied from one-eighth to twice the normal strength. This is dangerous.

Any 100 cc. of tincture made from 10 grammes of digitalis leaves with 70% alcohol by percolation is legal. Its activity will, however, vary greatly with the strength of the leaves.

Similarly, there is no legal standard for Pituitary nor Suprarenal Extract nor for preparations of Ergot. Even for Arsphenamine (Salvarsan, 606) there is in this country no legal standard of purity or strength. A physician depends solely on the manufacturers' tests. Every batch of Arsphenamine sold in the United States is tested by the Government before it can be sold. The physician in the United States is protected, here you are not. In the forthcoming edition of the U. S. P. it will be required that digitalis, strophanthus, pituitary, suprarenal and probably ergot preparations conform to certain standards of pharmacological activity. The physician in the United States will be protected, you will not. This again is dangerous.

The Canadian Medical Association, the Ontario Medical Association and even the Pharmaceutical Section of the Canadian Manufacturers' Association realize that this dangerous condition must be met and overcome. Consequently, these bodies, with the aid of the provincial Associations, are taking action. Your help may be required.

It is planned to approach the Government with the following proposals:-

1. That the Department of Health of the Dominion add to its laboratories one charged with and capable of the physiological assaying of drugs.

2. That the Governor in Council, under para. 14 of the Foods and Drugs Act, 1920, S.C. 10-11, George V, prescribe standards for:-

   (a) Arsphenamine and its allied substances.
   (b) Pituitary Extract
   (c) Suprarenal Extract
   (d) Standardized Tincture of Digitalis
       Standardized Tincture of Strophanthine
       Standardized Tincture of Ergot

3. That samples of all preparations of these drugs to be so labelled must be submitted by their manufacturers to the Laboratory of the Department of Health for assay and may not be sold or distributed until they are approved as of the required strength as per regulations to be laid down by the Governor-in-Council, and that they shall then bear upon their labels the Government approval and the Government number of the sample submitted.

4. That the manufacturer pay an adequate fee for each such sample submitted for analysis.

5. That the Department of Health, through the Inspectors appointed for the administration of the Act, obtain and assay samples of these products from time to time as sold by druggist or wholesale house to insure that such samples have not been tampered with subsequent to the approval for their sale having been given.

If the Government undertakes this task it will be a most important forward step and a great protection to every physician and his patients. It will be a real advance in our national development.

We are satisfied that the government at Ottawa will take this step if the profession demands it. Will you discuss it with your local member? Write to him about it. Let your local society or provincial society feel that you are behind the move. If you do not realize the need, we are willing to give you more information.
we are willing to give you more information.—V. E. **Henderson**, Dept. of Pharm., U. of T.

COAGULANTS AND HAEMORRHAGE

Occasionally both physicians and surgeons encounter in their patients bleeding that is difficult to control, epistaxis, bleeding from ulcers of the intestinal canal, pulmonary haemorrhage, heamorrhage of the new-born and, more rarely, haemophilia. From 1910 to '13 Howell published a series of papers in which he gave a new explanation of the process of clotting of the blood. He again attracted attention to the fact that extracts of tissue aid in clotting and ascribed this action to the presence of the complex fatty body, kephalin, which can be obtained most abundantly from the brain. Based on these papers many manufacturing houses have prepared "coagulant preparations" such as Coagulen (Ciba), Hemostatic Serum and Coagulose (P.D. & Co.), Kephalin (Armour), Thromboplastin (Squibb). Recently, 1921, Mills has shown that kephalin does not represent the important ingredient of tissue extract and much doubt has been cast on the whole explanation of Howell, which, it may be remarked, has never received general scientific acceptance. Further, these proprietary preparations have been carefully examined experimentally, both by Mills and by Hanzlik, and have been shown to have very slight activity, that of Coagulen, Hemostatic Serum and Coagulose proving but little more active than normal saline. The effect of the others was somewhat more marked. All these preparations are exceedingly weak compared with one recently prepared by Mills. The clinical reports on all these preparations are not very convincing. This is very natural. If one has bleeding from a ruptured artery into a viscus or cavity, a coagulent to stop the bleeding must produce a clot in the artery. Enough to do this may readily cause clotting elsewhere, as Mills has shown. If enough coagulent extract is used death occurs from clotting in the vessels. The margin of safety between clotting in the bleeding artery or vein and in the normal vessels must be small. If one applies the substance locally to the bleeding area it is necessary for it to be so absorbed as to reach the blood in the bleeding vessel. This will be hard to achieve. Capillary oozing from ulcers in the gut, as is well known, disappears and reappears without treatment in the most irregular fashion. One can never say when a drug has caused this. Haemorrhage of the new-born can be controlled and cured by transfusion, this is a known and safe procedure. Mills has further shown that small or slow injections of a strong coagulent tissue extract may greatly decrease the coagulability of the blood. Surely until the scientific basis for the use of these extracts is better established or their clinical usefulness fully shown in carefully controlled investigations, the physician should not be misled by the exaggerated claims of manufacturing houses cunningly concealed in a false scientific garb.

Correspondence

ROBERT C. PATERSON MEMORIAL FUND

The many friends of the late Dr. Robert C. Paterson were shocked to hear of his tragic death in Saranac Lake on December 24, 1921. A memorial is being planned as a tribute to the memory of a man, whose life was one of service to others, and the following letter has been sent to all former patients. We quote this letter feeling that many of the medical profession who knew Dr. Paterson will also be interested to contribute.

An outstanding Canadian physician, one of the best known in tuberculosis, this letter makes an appeal to all good Canadians.

A gold medallist of McGill, two years resident in Montreal General Hospital, two years in pathology and general medicine abroad. When health broke down he fought his disease to a stand still and then devoted his life to others.

He made notable contributions to our knowledge of tuberculosis and gave promise of much more in the future, both from the laboratory and the clinic. He offered his services to his country early in the war but was not accepted because of his physical condition. He did his part by carrying on at Saranac Lake shouldering much of the work there while six of the physicians were on war service.

Big of heart, big of body, open hearted, clean Scotch vigor in opinions and expression, he cheered and encouraged all whom he met. Wherever he went his bluff hearty manner made him friends, and his friendships were not of a moment.

His death was a tragedy, friends, patients, confreres, wife and family suddenly bereft. The memorial will be one of recognition, affection and gratitude.

To the Editor:-

Among a few of Dr. Robert C. Paterson's patients in Saranac Lake, the affection and gratitude which they felt for him have crystallized into a plan for a memorial trust fund to be administered by the Saranac Lake Society for the Control of Tuberculosis. The fund will be known as the Robert C. Paterson Memorial Fund, and the income will be used to aid deserving patients in temporary financial straits.

A committee has been formed on which Dr. E. R. Baldwin, Dr. Lawrason Brown, Dr. Hugh M. Kinghorn, Dr. J. A. Munroe and Dr. W. B. Soper, president of the Tuberculosis Society, have consented to serve as advisory members.

Cheques may be made payable to the Saranac Lake Society and addressed to A. P. Caywood, Exec.-Sec'y. Saranac Lake Society for the Control of Tuberculosis, Inc., Saranac Lake, N.Y.

JOHN B. BLACK
FREDERICK H. WOOLEY
HUGH M. KINGHORN

Saranac Lake, N.Y., February 10th, 1922.

ON THE CLAIMS OF CHIROPRACTICS

To the Editor:-

In view of the preposterous claims of osteopaths and chiropractors boldly advertised before a credulous public, it seems that some effort should be made to curtail their operations by legal means, and protect suffering ones from a very real danger. To justify their practice by stating that their work does not consist of operations with a knife or in the use of medicines is absurd. Our legislators must realize that the modern art of healing is not restricted to the use of drugs or to surgical operations and that while diseases are often treated successfully by the use of such agents as massage, exercise, electricity, and hydrotherapy, it should be emphasized that such treatment to avoid harmful results, must be based on a knowledge of the disease or condition to be treated.

The osteopath and chiropractor cannot in the few months of training received before they obtain their degree acquire such knowledge of the structure and function of the body in health and disease as would fit them to intelligently carry out any treatment.

There is fortunately, in Canada, an incorporated society of people practising massage and remedial gymnastics, membership in which is open to those who have satisfactorily passed a course in these subjects under medical direction. We venture to say that with regard to skill in manipulation and in knowledge of the conditions treated, their qualifications and the results obtained are superior to those of the osteopath and the chiropractor, and their work is only carried out under medical direction.

The remarkable results obtained by physiotherapy in military hospitals and convalescent homes are recognized by the medical profession and it seems a pity that such forms of treatment are not made use of more extensively in civil practice. Many members of the profession at the present do not sufficiently recognize the many advantages which may be obtained under this form of treatment when carefully and scientifically given, and we are glad to notice that this important form of treatment is gradually assuming a prominent place in the medical curriculum.

F. W. HARVEY

Montreal, March 3, 1922.

TUBERCULOSIS CONGRESS IN BRUSSELS

Sir:—The third Congress of the International Union Against Tuberculosis will be held in Brussels the 11th, 12th, 13th, of July, 1922. Papers and discussion will develop along three principal lines.

1. Prophylaxis of Tuberculosis among Children, (a) Pre-school age; (b) School age.
2. Prophylaxis Anti-Tuberculosis work in the homes by visiting nurses.
3. Suitable employment for the tuberculosis patient, and the arrested case.

Visits will be made to the different centers throughout Belgium, especially interesting for their tuberculosis achievement.

Canadians who may be in Europe at this time, and who might be inclined to contribute papers on different phases of Tuberculosis work, will be allowed thirty minutes for the reading of their papers. The Secretary for the Congress stipulates that the complete paper will be in the hands of the Secretary of the Canadian Association for the Prevention of Tuberculosis, Bank Street Chambers, Ottawa, not later than May first, to be forwarded by that office to the Secretary of the Conference. Yours sincerely,

R. E. Wodehouse, *Secretary*

Ottawa, March 30, 1922.

Men and Books

At a recent meeting of the Montreal Medico-Chirurgical Society, Dr. W. W. Chipman gave an address on "American Gynaecology;" an appreciation.

American medicine has a history of but three centuries. Three hundred years ago Giles Firman, Samuel Fuller, and John Winthrop practised medicine in Massachusetts, while Lawrence Bohun and John Pott were the first physicians in Virginia.

These men and their successors were the first physicians in America, men of sterling worth, "and of constant, if not warm, affections." These emigrant physicians were chiefly from Great Britain, and as time went on they trained their sons as their apprentices, and sent them back for their degrees to Edinburgh and London. It was these native-born apprentices who founded the first American medical schools; the University of Pennsylvania, in 1763; King's College, afterwards Columbia, in 1767; and Harvard, in 1782. In so doing, they really created American medicine.

Chief of these men were Benjamin Rush, William Shippen Junior, Samuel Bard, John Warren, and Philip Syng Physick. These men had all worked and studied with the great Hunters, William and John, and the other famous men whose names are associated with the eighteenth century revival of Medicine in England. They laid the foundations in America of medicine, surgery, and obstetrics; they were the forerunners who paved the way for the illustrious achievements soon to follow.

The first great achievement of American Surgery was ovariotomy. This operation was first performed by Ephraim McDowell, in Danville, Kentucky, on the 13th day of December, 1809. McDowell had gone to Edinburgh in 1793, the year of John Hunter's death, and had there learned of the drainage trocar, as the only palliative treatment for women suffering from "ovarian hydatids;"—the large ovarium cyst. John Hunter had said that hydatids of the ovary' might be taken out. There is no reason why women should not bear spaying as well as other animals." It remained for McDowell to carry this idea into execution.

By this operation the gates were set ajar to the opening of a new surgical life, for this operation made possible all abdominal surgery. Though the operation was at first condemned by both the profession and the laity, as "cruel and barbarous"—this was in the pre-anaesthetic days—still in forty years 36 operations had been performed, with but 15 deaths.

By an accidental step, ovariotomy led to the removal of a soft uterine "fibroid," when Walter Burnham of Lowell, in 1853, instead of an ovarian cyst, delivered through an abdominal incision, an enlarged uterus with its fibroid. He could not replace it, and was compelled to amputate—a courageous, though reluctant pioneer. So was launched hysterectomy.

At this time there came as a veritable gift from heaven the general use of Morton's ether anaesthesia. The happy word itself "anaesthesia" is the gift of Oliver Wendell Holmes, and Weir Mitchell poetically defines its slumber as "the death of pain." This was the beginning of abdominal surgery, and in this great beginning American surgeons took a leading part.

The second great surgical achievement in America was that of vaginal plastic surgery, beginning with the treatment of bladder fistulae by Marion Sims. The Women's Hospital, in New York, was opened in 1855, by this great Alabama surgeon. Sims' principles and methods were speedily adopted, not only in America but throughout the world; and his most illustrious disciple was Thomas Emmet.

These, then, were the two great paths, the one first travelled by McDowell and the other by Marion Sims along with which our special surgery in America has developed.

Obstetrics is also included here, for these two are co-partners from the very nature of the business. In America the history of obstetrics will always be associated with the name of Oliver Wendell Holmes, for he first recognized the contagious nature of puerperal fever, and, as it were, pointed the way for Semmelweiss, Pasteur and Lister. Gradually obstetrics was emancipated from the hands of the midwives, and released from prejudice, false modesty and tradition. Fierce objection was made at first to the use of ether during labour, as "it made the patient drunk, and no self-respecting woman would place herself under such an influence." Oddly enough, ether was first used in labour by Sir James Simpson, in 1847, and only later, in the same year, by Keep and Channing, of Boston.

Caesarean Section was first performed in America by John Lambert, at Newton, Ohio, in 1827, but it was only after the appearance of Saenger's monograph, in 1887, that the elective operation was undertaken.

Tarnier, of Paris, was the first to employ antiseptics in obstetrics, in the form of Lister's carbolic solution. Though Lister published his first report in 1867, it was only after the vindication of his work, by Robert Koch, in 1876, that his principles found acceptance in America.

In this year the American Gynecological Society was founded; and since that time obstetrics and gynecology have been wonderfully developed. The history of this progress in America is all written in its Transactions.

As we have seen, it is the work of three centuries, and during this time, America has made large and generous contributions, for she has given to the world anaesthesia, and rich gifts of surgical achievement. For the future, we must concern ourselves with special thinking and research. For it is only with the right conjunction of special thought with action, of science with art, that we can become a growing-point, the great growing-point of the coming century. It is by taking thought that we shall now add to our stature.

Abstracts from Current Literature

SURGERY

Diagnosis and Treatment of Intrathecal Tumours of the Spinal Cord. Thorburn, William: B.M.J., Jan. 14, 1922.

The subject is discussed because the writer fears that intrathecal tumours of the spinal cord are not readily recognized by the general body of the profession so that many of these tumours are allowed to run untreated their inevitable course to death.

He illustrated his remarks by showing two patients. The first a male aged 43 gave a history of indefinite pain below the left costal margin while in an army hospital convalescing from influenza in 1918. At first the pain was felt only in the mornings but gradually became more constant. He was discharged from the army March 1919 with a diagnosis of lumbago. From then until October 1919 he noticed a gradual increasing weakness of the left leg. About a month later the right leg became weak also, so that he was forced to give up work. By February 1920 he was entirely confined to bed through weakness. In March 1920 when the writer first saw him the patient could neither walk nor stand unsupported. When assisted to walk there was noted an extremely spastic gait more marked on the left side.

There was no marked atrophy but the left leg was a little thinner than the right. The sense of touch was fairly accurate throughout but there was a noticeable delay in response. The sense of heat, cold and pain were lost in the lower limbs and as high up as two inches above the umbilicus. Knee jerks exaggerated. Marked ankle clonus left. Plantar reaction was extensor. Abdominal and cremasteric skin reflexes were sluggish. Bladder and rectum normal. Pain, of the girdle type, was sufficiently severe to require nightly doses of opium.

A diagnosis of intrathecal tumour was made on the essential feature of the clinical history namely the pain of varying intensity associated with remissions which had not been localized in the back but had extended along one or more spinal segments. Secondarily on the gradual onset of paraplegia.

At operation a tumour 3 c.m. by 1.5 c.m., said to be "a fibroma of rather vascular and cellular type," was removed from the left anterior surface of the cord at the level of the 9th dorsal vertebra. The patient was able to walk with a stick six weeks later and eventually made a complete recovery.

The second case was that of a male aged 22 years who had been in good health until October 1920. The first thing noticed by the patient was a disagreeable sensation which he described "as if his toes were tied together." Weakness and incoordinated movements of the legs gradually developed. In December 1920 when the writer first saw him paraplegia was almost complete. Knee jerks and ankle clonus markedly increased. Anaesthesia was fairly marked and extended nearly to the waist line. Plantar reaction was flexor.

This the writer describes as the blurred image of the intrathecal tumour. Paraplegia was gradually increasing. The reflexes were those of a transverse lesion of the cord except for the plantar reaction. Pain had entirely disappeared and had never been severe.

An exploratory operation showed meningeal adhesions with slight restriction of the spinal cord about the level of the seventh dorsal vertebra. The spinal canal was opened and the adhesions separated. The patient made an uninterrupted and complete recovery.

In the writer's own words this case illustrates three points "first the great importance of exploring doubtful cases of transverse lesion of the cord—that is to say, all cases which are not obviously hopeless; secondly, that you are more likely to do good than harm should a diagnosis of a thecal tumour prove incorrect; and thirdly, because I hold that there is a strong probability that many early cases of transverse myelitis may be arrested and cured by incision and drainage of the dura mater."

A. ROSS

The Value of Freedom and Exercise After Operations. Rowlands, R. P.; B.M.J., Jan. 14th, 1922.

The necessity for rest after operations has in the writer's opinion been greatly exaggerated. He has from observation and experience gradually shortened this period and believes that he has thereby helped his patients.

Rest must be maintained while there is pain and while there is an exhausted nervous system but early movements must be begun as soon as possible because they increase the heart action, accelerate the blood stream, and thereby lessen the post-operative tendency towards mental depression, thrombosis, embolism, hypostatic pneumonia, adhesions of the viscera, muscular atrophy and constipation without interfering in any way with the healing of the wound.

Taking appendectomy and the radical cure for hernia as examples he allows his patients to move in their beds as much as they like from the first; the freedom of their room on the fourth day; their bath on the seventh, and a short walk or drive on the tenth.

A. ROSS

Closure of the Abdomen Without Drainage After Cholecystectomy and Choledochotomy. Richter, H. M., Surg. Gyn. and Obstet., Feb. 1922.

The author has closed the abdomen without drainage in infective conditions associated with frankly developed peritonitis wherever he has been able to remove the source of continuous infection, except where peritonitis was far advanced.

Operation upon biliary structures has the advantage over intestinal surgery of dealing with far less infective material.

In the operation of cholecystectomy, because the bile tension is far less that the arterial tension of a small vessel, fine catgut is ample in ligating the cystic duct to prevent leakage of bile. The use of heavy ligature material partakes of the nature of an objectionable foreign body.

No attention other than a temporary packing is paid to the raw edges of the liver bed left after the removal of the gall bladder since its sides tend to fall together and any foreign body used as drainage material will cause dense adhesions.

Because of the known tolerance of the peritoneum the effect of the bile leakage from the liver surface is of little clinical importance.

Drainage material, if placed in contact with the ligated cystic duct may cause a biliary fistula, because it prevents primary union which is the insurance against leakage.

Closure of the abdomen without drainage is contra-indicated.

1.—Where there is persistent oozing. Here gauze packing is necessary.

2.—Where there is active infection or actual suppuration outside of the gall bladder.

In operations of choledochotomy, the common duct may be sutured and closed without drainage, the advantages being analogous to those in cholecystectomy.

The peritoneal coat must always be included in the line of suture and not sufficiently damaged as to render it useless.

The suture materials and needles must be of the finest size. Rope-like suture material will cut through, permitting bile leakage.

Closure of the abdomen is contra-indicated in jaundice or acute infections.

B. F. MACNAUGHTON

Obstetrical Paralysis of the Peroneal Nerve.

Whitman, Armitage: Surg. Gyn. Obst., Jan. 1922.

In this case a woman of forty-three, at her ninth confinement,, had much difficulty necessitating the use of forceps in the delivery of a 10½ lb. baby. Immediately on her return to bed the patient was conscious of great pain in both legs, and inability to move the left foot. The pain gradually wore off, and on the eighth day post-partum she attempted to get up, but was unable to walk because of the left foot giving way under her. Relief was sought at Dr. Royal Whitman's clinic at the Hospital for the Ruptured and Crippled. Her condition was one of paralytic varus with drop foot. Although the condition is termed peroneal or external popliteal paralysis it is evident from the findings that Dr. Whitman's diagnosis is injury to the trunk of the sciatic in the pelvis, probably by forceps or the infant's head, inasmuch as the whole leg below the knee was at first paralyzed. Dr. Whitman, however, discusses the condition which was simulated, i.e. injury to the peroneal nerve at the knee by the use of the leg-holder. The paralysis was present a year after injury.

J. A. NUTTER

MEDICINE

The Effect of Syphilitic Infection on the Heart.

Stobie, William: Quart. J. Med., Oct. 1921.

The author deals at some length with the pathological and clinical manifestations of syphilis as it affects the heart. He finds that the infection may occur in the congenital and acquired forms of disease either at an early or late stage. The anatomical lesions include gummata, general fibrosis and aneurysmal dilatation of the heart, slight thickening of the endocardium, with coronary arterial disease and pericardial effusion with spirochaetes.

The clinical pictures showed that aortic valvular disease was the most common. Mitral disease with stenosis was found in three out of fifteen cases. Occasionally the Stokes-Adams syndrome was found. Sudden death occurred in two patients, in one of whom a gumma of the endocardium was found at the autopsy, and in the other a thickening of the general endocardium. In these latter cases the heart's action had been noted to be strong in comparison with the pulse, and the symptoms complained of were anginal and fainting attacks wih precordial pain and shortness of breath.

C. F. MARTIN

Some Aspects of Exophthalmic Goitre.

Campbell, J. N. H.: Quart. J. Med., Oct. 1921.

The paper deals with cases treated in Guy's Hospital from 1908-17, in all 127 cases, of which 89 were traced to the time of their death, or for varying intervals from 4 - 16 years. The author regards exophthalmic goitre as a clearly defined condition, in which the majority of the following signs are present within a short time of the onset of the disease: exophthalmos, enlarged thyroid, tremor, tachycardia, increased metabolism, increased sweating and undue nervous excitability. Arrhythmia is frequently present. Some severe mental changes, and bouts of gastric crises and diarrhoea are characteristic of the disease, but are not so constantly present.

The author suggests that the term "hyperthyroidism" should be confined to a much less marked condition, in which two or three only of these signs are present; it is less dangerous and more easily cured, and does not tend to develop into true exophthalmic goitre. The condition is found generally in older women. Exophthalmic goitre is four times more commonly found among unmarried than among married women, and nearly 70 per cent occur in unmarried women of child-bearing age. The signs and symptoms are in the main those of over-secretion of normal thyroid substance, and it would seem that associated with this, there are changes in the internal secretion of the ovary and other glands. During an attack of exophthalmic goitre, the resistence to infection is very much diminished.

With regard to prognosis, this series has shown that 40 per cent. are almost cured, 30 per cent. so much improved that they return to a normal way of life, while 15 per cent. are not much improved, or become worse, and 15 per cent died. The average duration of the illness is about three years. In most of the fatal cases death occurred within the first year. The surgical treatment is discussed. As a result of thyroidectomy, there is in most cases a great improvement, but the author insists that the final result has not proven to be greatly superior to that obtained by medical treatment. Nevertheless, it would seem that, after allowing for the operative mortality, there appears to be a much smaller proportion of fatal cases. Where a long period of rest is not possible, cases may be saved from permanent injury to the heart by operation.

C. F. MARTIN

Gonorrhoeal Infection of the Nervous System. O'Connor, E. Quart. J. Med., October 1921.

The author endeavours to establish a rough classification of the parts of the nervous system mainly affected. He is unable to determine whether the nervous system is usually infected through the lymph-channels or the blood, or in which cases the gonococcus and its toxin are respectively responsible. He concludes that gonorrhoea has a tendency to produce slight psychiatric manifestations, which may be due to a feeble toxemia. Obstinate chronic cases evolve neurasthenia and hypochondriasis, and a tendency to grave melancholia. Occasional cases of meningomyelitis have been found, but there seems little evidence that multiple neuritis arises from this form of infection. Minor cases of neuritis and neuralgias are relatively common.

Speaking generally, no gonorrhoeal complication can be rigidly attributed to the primary causal organism alone; on the contrary, he stresses the point that every complication has a complex etiology.

C. F. MARTIN

The Serum Prophylaxis of Measles. McNeal, M.D., J.A.M.A., Feb. 4th, 1922.

Statistics show that about 91 per cent. of deaths from measles occur in children below six years of age, while only 8 per cent. die in cases between six and fourteen years.

In institutions caring for small children the death rate may be high, as much as 37 per cent. having been reported.

The prevention of exposure to measles is difficult owing to the 3 or 4 days of uncharacteristic prodromal symptoms. Preventative measures of some kind seem then desirable.

It has been found that the intramuscular injection of 15 cc. of serum derived from a person in the tenth or later day of the disease will prevent infection in those exposed while many cases innoculated with a lesser amount 3 to 4 cc. developed an attenuated form of the disease.

The serum of measles patients taken before the 7th day has little or no immunizing properties. On the other hand, immune serum given after the seventh day of the disease produces little or no effect.

The immune serum is usually derived from patients three or four days after the fever has disappeared and may be preserved for subsequent use by the use of 0.01 per cent. tricresol. These preventative measures are of particular value in institutions where there are delicate and poorly nourished children.

A. H. MACCORDICK

Experimental Innoculation of Human Throats With Virulent Diphtheria Bacilli. Guthrie, S. C., Marshall. B. C. and Moss, W. L. Bull, Johns Hopkins Hosp. Dec. 1921.

Diphtheria bacilli obtained from the throat of an otherwise healthy carrier, and proven to be virulent for guinea pigs, were innoculated into the throats of eight volunteers. Four of the eight had previously given a positive Schick test and all four developed clinical diphtheria. The other four gave negative Schick tests and none developed the disease after innoculation.

All of those innoculated with the exception of one who had given a negative Schick test became carriers.

The authors have found that the administration of antitoxin does not always prevent the carrier state. They also believe that the guinea pig test can be relied upon to estimate the virulence of diphtheria bacilli.

Diphtheria bacilli of a virulent type in the throats of otherwise healthy carriers can produce clinical diphtheria in susceptible individuals.

A. H. MACCORDICK

The Prevalence of Free Hydrochloric Acid in Cases of Carcinoma of the Stomach. Hartman, Harold R., Am. J. Med. Sc. Feb. 1922.

The author points out the habit we have acquired of considering achlorhydria as a diagnostic sign of carcinoma of the stomach, until at present one hesitates to make a diagnosis of carcinoma in the presence of an appreciable amount of free HC1. in the gastric contents.

A study was made of the cases of gastric carcinoma occurring at the Mayo Clinic during the years 1918, 1919, 1920. During these years, there were 551 patients with gastric carcinoma and 80 patients with carcinomatous ulcer operated on. Forty-five per cent. of the cases were diagnosed ulcer, 41.25 per cent cancer, and in 12.15 per cent the diagnosis was suspected gastric malignancy.

The normal amount of free HC1. was estimated at from 20 to 40. With regard to location, in 51.85 per cent of pyloric lesions, achlorhydria was present. In 5.05 per cent of pyloric lesions there was hyperacidity. In the cardiac portion, the achlorhydria was 61.54 per cent and the hyperacid 5.12 per cent from which it is apparent that the location of the lesion does not influence the degree of acidity. In all cases recorded 21.95 per cent had a hyperacidity, that is to say, hyperacidity existed in more than one case out of every five.

When the cases of gastric ulcer undergoing malignant changes are included, it is found that 26.93 per cent, or about one case out of every four had normal or hyperacid findings. Over 42 per cent had some free HC1. present, which means that one should expect to find free HC1. present in about every other case.

In a word, therefore, achlorhydria is present in a little less than one half the cases of carcinoma of the stomach, and normal or hyperacid values in more than one fourth.

The acid values are the highest readings obtained by the fractional method.

J. G. BROWNE

A Study of Pneumonias and Types of Pneumococci. Mulloch, Archibald; Quart. J. Med. Jan. 1922.

This very carefully prepared article deals with cases that have been studied both clinically and bacteriologically, taking note of the various complications that arose presumably due to different types of pneumococci. The results of the work show the relative incidence during a year and a half at one hospital of various types of pneumococci in lobar pneumonia. An effort was made to determine the type of organism as early as possible in order that specific treatment might be begun early. The average duration of the disease before admission was 4.3 days in the case of 53 lobar pneumonias. The data are concerned only with the types that occur in England. Rapid cultural methods were preferred to those of the urine precipitin test. The most satisfactory method of all is that of mouse innoculation, in which agglutination can be carried out after 12 hours.

In the 65 lobar cases studied, the proportions of the different types were similar to those in America, except that much fewer of Type III were found, while more cases were due to a typical Type II sub-group. At least one-third of all lobar cases in England are due to Type I, and this is the group for which specific antiserum has proved of benefit. The death rates in all but Type II cases were lower than in America.

As regards complications, these were more numerous in the Type I group than in any other.

Pfeiffer's bacillus may grow out in the mouse or on blood agar innoculated with washed sputum of pneumonia cases, but it was found much oftener in association with Type IV both in lobar, and especially in broncho-pneumonic cases than with any other types.

Type I was isolated from cases of pneumococcal peritonitis; twice in fatal cases in children, with the generalized septicaemic form; and twice from adults (with no septicaemia), who recovered.

The writer very properly pays little attention to determining the relative frequency of lobar and broncho-pneumonia.

C. F. MARTIN

Observations on the Circulation and Respiration in a Case of Paroxysmal Tachycardia.

Barcroft, Bock and Roughton; Heart, Vol. IX, No. 1, December 1921.

This research deals with the circulatory condition existing in paroxysmal tachycardia. It was found possible to measure the quantity of blood passing through the chest per minute; combining the minute volume with the pulse, the systolic output is obtained. In addition to this, the determination of the oxygen concentration of the arterial blood and venous blood were made, throwing some light on the effect of rapid and shallow respiration on the oxygen content of the arterial blood.

In the patient studied, the attacks were abrupt in onset and sudden in their termination. They were characterized chiefly by dyspnoea, abnormal heart action, cyanosis, gastric disturbances, sweating and weakness. In their study the authors were unable to make a complete series of determinations in any one attack. Their conclusions were as follows:-

In two attacks of paroxysmal tachycardia, in which the pulse was upwards of 200, the minute volume sank from 5-6.1 litres to 2.8-2.1 litres per minute, or roughly to a half to a third of the normal value.

The degree of ischaemia was particularly marked in the skin, as shown by analysis of the blood from the basilar vein.

There was no reduction in the saturation of the arterial blood, but if anything, a rise.

The depth of respiration was reduced to nearly half the normal, while the rate was about doubled.

The systolic output - 77.5 - 12.9 cc.

The total oxygen consumption of the body was also considerably lower during two of the attacks.

C. F. MARTIN

Observations on the Action of Quinidine—with Special Reference to Auricular Fibrillation.

Lewis, T., Drury, Iliescu and Wedd; Heart, Vol. IX, No. 1, December 1921.

The employment of quinidine has recently come much into vogue, especially for its action on auricular fibrillation. A very careful series of observations was made by the authors on the dog's heart and elaborate tables of their observations were prepared to estimate in general the various functions which are affected by the use of the drug.

Quinidine sulphate, it was found, when given to dogs in doses comparable to those used clinically, has the following effects:-

1. It lowers the S-A rate considerably.

2. It reduces the rate of conduction in auricle and ventricle; it depresses the A-V conduction.

3. It lengthens the absolute refractory period of the auricle muscle.

4. It causes a partial paralysis of the vagus.

The first three of these effects result from a direct action on the muscle; they are produced simultaneously and are recovered from simultaneously. The nature of the action of quinidine appears to be in a large part independent of the rate of beating; at higher rates of beating it is reinforced by the partially refractory period factor. A curious reversed action of the vagus upon A-V conduction is described as happening under quinidine. The effects of the drug upon clinical fibrillation of the auricle are explained, if this last effect is regarded as fundamentally due to circus movement. A sufficient lengthening of the refractory period, by reducing the responsive gap, will bring the circus movement to an end or it will slow the circuit movement. An increased rate of ventricular beating under quinidine in auricular fibrillation is ascribed to the lower rate of auricular beating in part and in part to the paresis of the vagi.

C. F. MARTIN

Some Observations on Epilepsy. Sargent Percy, C.M.G.; Brain, Vol. XLIV—Part III.

In his address before the Section of Neurology of the Royal Society of Medicine, the author deals with the question of operative procedure on various types of epilepsy. In his opening remarks, he refers with some emphasis to the training required by one who would deal with the surgery of the nervous system. He differs from those who hold that the surgeon who concerns himself with operations on the nervous system should be his own neurologist; this, he considers, is quite unpracticable, for he who would be a neurologist should also be a general physician of wide experience, and he who would concern himself with the surgery of the brain should also be very familiar with general surgery. Mr. Sargent holds that the nervous system is not a suitable field for surgical specialism in the more restricted sense of the term.

The difficulty with the surgical treatment of epilepsy arises through our ignorance of the etiological factors in a fit—whether the convulsion be focal or not, in origin; there would seem to be no essential precipitating cause common to all forms.

The author deals at some length with epileptic fits which have arisen from gunshot wounds of the head, and those he divides into three main groups:-

1. Recent lesions following a local contusion, associated with haemorrhages and oedema.
2. Inflammatory lesions, due to recrudescent sepsis.
3. Cicatrices binding the scalp to the brain and membranes through a cranial defect.

In these three cases it would seem that surgical interference is justified not only on the ground that reasonable explanation exists of the mechanism by which the fits are evoked, but also because there is sufficient evidence to show that fits can either be abolished or reduced in number and severity by an operation, which either removes entirely or modifies the local exciting cause.

He next deals with the treatment of fits other than those of traumatic origin, whether associated or not with local lesions of the brain. These he divides into three groups:-

1. A lesion easily localized and giving some evidence as to its nature (tumours, abscesses, gummata). The author observes that while any of these lesions may constitute the starting point of an epileptic attack, it must not be forgotten that there is no gross lesion, traumatic or otherwise, which necessarily causes the fits. On the contrary, the proportion of patients with any such lesion who develop fits is small. To say that a lesion irritates the brain creates fresh difficulties by raising the question of the exact meaning of "irritation." The surgical treatment of this group is directed towards dealing with the focal lesion and an effort at its removal. Where this can be easily done, the outlook is good. On the other hand, when an abscess has to be drained, fits are less likely to be abolished.

2. This group includes cases of a focal character in which the nature of the lesion can only be determined by exploratory operation. Such exploration is not always productive of results; at all events, the results are not so uniformly good as to recommend cortical excision unless the localization has been carried out by electrical excitation.

3. The third group of so-called idiopathic epilepsy presents to Mr. Sargent no excuse whatsoever for surgical operation. Except where hope triumphs over experience, the surgeon must be a veritable optimist indeed who would continue to treat idiopathic epilepsy by surgical means

C. F. MARTIN

The Association

ANNUAL MEETING, WINNIPEG, JUNE 20th-23rd, INCLUSIVE

The Local Committee are striving to make this meeting not only a most valuable one from a scientific standpoint but also one in which agreeable social features will be amply provided for.

REMEMBER THE DATES

June 20th-23rd inclusive

The first day is intended primarily for the transaction of business but the entertainment programme commences that date also. Wednesday, Thursday and Friday are to be devoted to Section Meetings in the mornings and general sessions in the afternoons. The Committee are determined that all sessions shall commence *promptly* at the specified time and the arrangement of programme is such that the sessions shall not be unduly long.

A well rounded programme is in preparation. Dr. L. F. Barker of Baltimore is to give the address in Medicine and Dr. J. M. T. Finney, also of Baltimore, has been asked to give the address in Surgery. The Surgical Section will have a programme representative of all parts of the Dominion, among others Drs. Cole, of New York, McKechnie of Vancouver, Starr and Primrose of Toronto, Bazin and Gurd of Montreal will take part.

Among those contributing to the medical programme are Drs. Brown, Banting, Gwynn, Goldie and McPhedran of Toronto, Drs. C. K. Russell, C. F. Martin and Finley of Montreal, Dr. Jas. Miller of Kingston, Dr. H. C. Steeves, New Westminster, Dr. Kenneth MacKenzie, Halifax, Dr. Campbell Howard of Iowa City, Iowa, Dr. D. A. Stewart, Ninette and Drs. C. Hunter, A. J. Burridge and F. A. Young, Winnipeg.

The Eye, Ear, Nose and Throat Section promise a valuable programme and a special effort is being put forth to make the General Sections particularly interesting and valuable.

Instead of a formal Pathological Section, short morning demonstrations are to be held in the Museum. An extensive exhibit of specimens is being arranged and some very valuable contributions will be made.

All sessions will be held in the Royal Alexandra Hotel, Scientific and Commercial exhibits will be in close proximity to the rooms in which meetings are to be held.

Hotel accommodation will be ample. Those desiring to secure accommodation in the Headquarters Hotel will do well to communicate *early* with Dr. Gordon S. Fahrni, of the Hotel, Information and Transportation Committee, 507 Boyd Building, Winnipeg. Rooms may be secured at the rates of $2-$5 for single room without bath or $3-$8 with bath. Double rooms at proportionate rates.

It is expected that arrangements will be consummated with the railways whereby round trip tickets will be available at one fare and one half.

The Canadian Society of Anaesthetists and the Canadian Radiological Society are holding their annual meetings in Winnipeg during the period June 20th-23rd, 1922. The presence of these two important organizations will add much to value of the C.M.A. Meeting. Arrangements are being made for eminent members and guests of these Societies to take part in the Sessions of the Canadian Medical Association.

It is the earnest wish of the Local Committee that every medical man in Canada will strive to come to the Meeting. Winnipeg is situated almost exactly midway between East and West. We should have and expect a record attendance. Every effort will be made to make the Meeting and the stay in Winnipeg worth while and each individual may rest assured that a kindly welcome awaits him.

The profession of Winnipeg and of the West generally, welcomes this opportunity of entertaining the C.M.A. and reaffirming the bonds of friendship that have marked previous meetings of the Association.

BULLETIN No. 2.
ENTERTAINMENT COMMITTEE

The Annual Meeting will be held in Winnipeg—June 20th-23rd, 1922.

DON'T FORGET THE DATE

What the Meeting will be: A Recreational Free-for-All. A gloom banishing golfing swatfest; a chance to renew the friendships of youth, and to compare with old associates, changes in girth and alopecia. An opportunity for the Aesculapians of the East to behold Greater Canada, to feast their eyes upon the wonderful prairie country, the fields of golden grain, and the incomparable scenery of British Columbia.

SPECIAL SCIENTIFIC ATTRACTIONS

For *The Oculist.*—A recently discovered specimen of Porcus Caecus.

The Ornithological Oto-Laryngologist.— An unusually large collection of the species Hirunda Sicca.

Bring your Golfing tools—your wife—an ice cap, and the spirit of youth and fraternity Remember the date—June 20th-23rd, 1922.

Congenital Syphilis—JOSEPH S. LAWRENCE, Albany, N. Y., assisted in making a survey of the families from which syphilitic patients came to Ward's Island. Among the 254 immediate relatives of seventy-five patients, syphilis was established in fifty cases, or 19.6 per cent. The inmates of a large number of orphanages were also examined. Of 11,205 persons ranging in age from 2 to 21 years, with an average of 10 years, 1.1 per cent of all gave a four plus reaction to alcoholic and cholesterinized antigens. Defects were most frequently noted among those with positive Wassermann reactions. After the results of the blood examinations were known and the children had been grouped as to whether they had a positive, doubtful or negative reaction, it was found that those with clinical symptoms suggestive of syphilis were not all in the positive group, but that many were included with those having a doubtful blood reaction. It was therefore decided to make a careful survey of the immediate relatives, when possible. The families of fourteen children with positive reactions, of 263 children with doubtful reactions, and of sixty-six children with negative reactions were investigated. It is shown that when the children had positive blood tests, 82 per cent of the relatives tested were positive, or, in other words, including the fourteen children originally examined, twenty-three cases of syphilis were found among twenty-five individuals from six families. The findings in the doubtful group were equally interesting. Of the 173 relatives tested, twenty-three, or 13 per cent., were found to have definite four plus Wassermann reactions to specimens of their blood, while the reactions for the children themselves were at best classified as doubtful.—Jour. A. M. A., Feb. 25, 1922

Oxygen Inflations of Peritoneal Cavity in Tuberculous Exudative Peritonitis—ARTHUR STEIN, New York, reports what he believes to be the first case to be reported in the United States of an apparent cure of tuberculous peritonitis of the exudative type by the sole means of therapeutic pneumoperitoneum. The patient was a woman, aged 32, who five months after a laparotomy manifested acute symptoms of tuberculous exudative peritonitis. A roentgenogram was taken following artificial pneumoperitoneum. Roentgenographically, the case presented evidence of tuberculous peritonitis. The oxygen which was injected at the time of the pneumoperitoneal roentgen-ray examination was not withdrawn. Thirty-six hours later there was still some oxygen present. The whole procedure did not cause the patient the slightest discomfort, and the improvement in her general condition after this single inflation was most marked. Three additional injections were made, two, four and six days later. The patient, apparently, made a complete recovery.—Jour. A. M. A., Mar. 14, 1922

News Items

ONTARIO

FORTY-SECOND ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION
MAY 30, 31, JUNE 1 AND 2, 1922

THE forty-second Annual Meeting of the Ontario Medical Association is to be held this year in Toronto on the above dates. Preparations for the meeting are fairly well completed, and the members are assured of an interesting and instructive programme.

Dr. Macfie Campbell, an outstanding Psychiatrist of Boston, will present the opening address in Convocation Hall on the evening of Monday, May 29th, choosing for his subject, "The Modern Conception of Mental Disease." This meeting will be open to the general public, as it is believed that many persons outside the Profession will be keenly interested in what Dr. Campbell has to say.

University College will be the headquarters of the Association during the next four days, splendid accommodation therein having kindly been placed at the disposal of the Association by the University authorities.

Tuesday, May 30th, is Business Day, the deliberations of the Directors and the Committee on General Purposes, the latter being the Parliament of the Association, occupying the morning and afternoon.

The Round Table Evening, with dinner being served at 6:30 P.M. will be held on Tuesday, May 30th, at the Academy of Medicine, 13 Queen's Park. This function has become one of the most popular features of the annual meeting, and the evening's discussion which will touch upon the relation of the Profession to the Public, and also on the subject of Drugs, from a point of view hitherto little discussed by the Profession, will no doubt appeal to a large number of the members.

Wednesday, Thursday and Friday will be largely devoted to the scientific sections, the programme for which will shortly be announced.

The Association Dinner, to which the ladies are invited, will be held at the King Edward Hotel on Wednesday night, when the address of the President, Dr. F. J. Farley, will be delivered.

Dr. and Mrs. Herbert Bruce have very kindly invited the Association and its visitors to be their guests at a garden party on Thursday afternoon. Thursday evening is being left free for class reunions and private entertainment.

The various sections believe that they have gathered together a programme which will please the Profession, and it is anticipated that the attendance will be the largest in the history of the Association.

The Secretary of the Association, Dr. T. C. Routley, of 127 Oakwood Ave., Toronto, will be glad to answer any enquiries regarding the meeting or secure accommodation for any intending visitors.

STUDENTS' NIGHT AT ACADEMY OF MEDICINE.—Considering that it was not only necessary but also helpful to the men themselves that the graduating class should know the aims and objects of the Medical Society and of Libraries and Medical Associations, the President and Council of the Academy gave a reception to the fifth year students on the night of Friday, March 3rd. The aims of the Academy were set forth by the President, Dr. Noble. The value of good records and a good library were detailed by Dr. Primrose. The relation of the physician to the Medical Societies was pointed out by Dr. G. S. Young, and some original descriptions of diseases as found in medical practice were delightfully put forth by Dr. J. H. Elliott. After the programme, the various collections of books and belongings of the Academy were shown by various of the Fellows. Practically the whole of the graduating class was present at this meeting,—a meeting which has the unique distinction of being the first occasion at which an Academy or College has recognized that its duty and pleasure must include certain performances which introduce the younger minds to the conditions of medical life which they may be asked to consider later on. The step is a step in advance, a procedure which should make easier the work of medical education throughout the province, for it can be safely said that one of the most positive causes of the lack of interest so often met with when the question of Medical Societies is brought up in the provinces is that the majority of men with whom one strives to get in touch have been allowed to graduate without the thought or the idea of Medical Associations or medical gatherings for their future benefit ever having been put before them.

The Academy is to be congratulated on its generosity and farsightedness; to let one hundred and fifty students know that an old organization is interested in their future is a step the far-reaching results of which will be hard to over estimate.

Further meetings of the Academy for March were the stated meeting for March 7th at which the principal address was one by Sir Bertram Windle, F.R S, on "Medicine and Surgery in Early Mediaeval England." March 9th, Section of Obstetrics and Gynaecology; March 14th, Section of Medicine, Symposium on Arteriosclerosis; Section of Pediatrics, March 16th, Clinical Evening at Hospital for Sick Children; March 21st, joint meeting of Section of Pathology and Surgery; March 28th, Section of State Medicine.

DR. CHAS. W. BURR of Philadelphia addressed the Hamilton Medical Society on Wednesday, March 1st, on questions of Neurology and Psychiatry; on March 2nd, Dr. Burr conducted a Neurological Clinic at the Toronto General Hospital.

DR. D. E. S. WISHART sailed for England for further Post Graduate work in Otolaryngology in Edinburgh after two years of service in the Massachusetts Eye and Ear Infirmary and special work in Philadelphia in Bronchoscopy.

COUNTY SOCIETY MEETINGS.—The St. Thomas Medical Society met on January 6th and was addressed by Dr. Charles H. Gilmour of Toronto, the subject of his discourse being "A Study of the Various Means Available for Establishing Diagnosis in Diseases of the Kidneys, Ureters and Bladder."

At the meeting of March 3rd, Dr. D. King Smith of Toronto talked upon the "Commoner Skin Diseases, their Treatment and Diagnosis." Good attendances and discussions were recorded for both meetings.

The Sault Ste. Marie Medical Association staged two meetings in January, the first of a series of six addresses arranged for by the Ontario Medical Association. On January 7th, Dr. Wm. Goldie of Toronto presented a paper on "The Interpretation of the Signs and Symptoms of Gastro-Intestinal Disease." On January 28th, Dr. E. Stanley Ryerson of Toronto lectured on "The Pathology of the Gall Bladder and Bile Ducts and its Relation to the Clinical Manifestations of Disease, and the Surgical Treatment Indicated." There were good attendances at both lectures.

The Brant County Medical Society met on the evening of January 12th and was addressed by Dr. F. W. Marlow of Toronto on the subject of "Symptomatology of Pelvic Disease." Active appreciation was expressed of the efforts of the O.M.A. in respect to the system of lectures now being instituted throughout the Province.

Perth County Medical Society met in Stratford on the evening of Wednesday, January 18th. The address of the evening on "High Blood Pressure and Arteriosclerosis" was given by Dr. John Oille of Toronto.

The North Waterloo Medical Society met in Kitchener on Friday, January 20th. This was one of a series of six meetings being conducted by the North Waterloo Society, the speakers for which are supplied by the Ontario Medical Association. At this meeting, a very practical address was given by Dr. Geo. S. Strathy of Toronto on "The Differential Diagnosis of Pain in the Back."

An organization meeting for the County of Renfrew was held in Renfrew on Friday, January 20th. Dr. T. C. Routley, Secretary of the Ontario Medical Association outlined the various steps to be taken to organize a County Society, and, before the close of the meeting, it was resolved that there should be a Renfrew County Medical Society in active affiliation with the Ontario Medical Association. Dr. W. E. Gallie of Toronto gave a very interesting and practical talk on "Fractures," demonstrating the application of plaster splints to various parts of the body.

Dr. A. Primrose of Toronto addressed the Sault Ste. Marie Medical Society on Saturday, February 11th, choosing as his subject "A Clinical Study of Tumours of the Breast

Dr. J. H. Elliott of Toronto addressed the South Waterloo Medical Society in Galt on Wednesday, January 25th. The subject of his address was "The Problem of Infection in Tuberculosis and its Importance in the Prevention and Treatment of Tuberculosis." An excellent discussion followed his presentation.

The Middlesex County Medical Association met in London on February 1st. An address was given by Dr John Oille of Toronto on "High Blood Pressure and Arteriosclerosis."

The North Bay District Medical Society was addressed on the evening of January 17th by Dr. C. L. Starr of Toronto on "Acute Abdominal Conditions of Childhood."

The Peterborough Medical Society held its regular fortnightly meeting on Thursday, February 2nd, and was addressed by Dr. Jas. Miller of Queen's University, on the subject of "Histological Changes in the Lung in Pulmonary Tuberculosis."

Dr. L. J. Austin, Professor of Clinical Surgery at Queen's University Medical School, addressed the Ottawa Medical Society at Ottawa on Friday, February 3rd, on "The Pathology, Diagnosis and Treatment of Gall Stones." A very active discussion followed the address, the following points especially attracting attention:—(1) recurrence of Gall stones after operation. (2) Recurring symptoms after operation, in cases where the Gall Bladder had been removed. (3) The value of *x*-Ray Diagnosis. (4) The value of the Meltzer-Lyon Duodenal Examinations.

The Twin Cities of Port Arthur and Fort William, representing the Thunder Bay Medical Society with a membership of nearly thirty Doctors, shows a membership in both the Ontario and Canadian Medical Associations of 100%.

The members of the Thunder Bay Medical Society can justly be proud of the record they have established. The Ontario Medical Association extends congratulations and greetings to its most remote branch, which, though upwards of one thousand miles distant from the headquarters of the Association, presents 100% membership in the Association. This is a record which all other parts of the Province might endeavour to emulate to the satisfaction and advantage of themselves and the Association as a whole.

NOVA SCOTIA

The Osler Medico Historical Club of Halifax.—This club, which was started on the initiative of Prof. A. G. Nicholls of Dalhousie University, has been in existence for rather more than a year. Composed of a band of twelve or thirteen congenial spirits, it has met monthly during the past academic season. Its objects are to stimulate an interest in the historical and literary side of Medicine, to acquaint the members with the great scientific currents in medical thought; and to foster the use and development of the university library.

The machinery is of the simplest. The essayist for the evening is the chairman. He abstracts his own paper for the minutes, and reads his minutes on the occasion of the next meeting. An archivist is appointed whose duties are to collect and bind the productions of the members, and to deposit them in the university library. The subjects to be chosen must be biographical, historical, or literary, and in some way related to the evolution of Medicine. The members meet at one another's houses, and after a full discussion of the essay or subject presented at the meeting, the evening ends with refreshments. Frequently, the monographs presented are illustrated with books, pictures, and lantern slides.

Lady Osler, on the request of the founder, graciously gave her consent to the use of the name "Osler" as a designation for the Society, and, in addition, sent to it the latest portrait of Sir William. Her kind thought was, it is hardly necessary to say, much appreciated by the members. So far the following papers have been presented:—

- Thomas Willis, M.D., F.R.S., by Prof. Nicholls.
- John Hunter, by Prof. John Cameron.
- Daniel McL. Parker, by Dr. W. Alan Curry
- The Edinburgh School of Surgery, by Dr. Gerald Grant.
- The Man who discovered the Circulation of the Blood, by Prof. D. Fraser Harris.
- Sir James Y. Simpson and Anaesthesia, by Dr. M. D. Morrison
- Oliver Goldsmith and Oliver Wendell Holmes, by Dr. G. H Murphy.

The prospects for the Club are highly encouraging; all the meetings have been well attended, and the members are enthusiastic of the benefits and pleasure derived from them. It is hoped that the interest thus created in the subject of medical history, may result in the acquirement by the members, of books, pictures, relics, autographs, and other objects relating thereto, which may ultimately enrich the Medical Library of Dalhousie University, and help all to get away to some extent from the mere "bread-and-butter" side of professional work

QUEBEC

Canadian National Committee of Mental Hygiene.—The Annual Meeting of the Committee was held at the Ritz Carlton Hotel, Montreal, on February 17th, over four hundred people being present. Addresses were given by Sir Vincent Meredith, Bart., Lady Byng of Vimy, Dr. C. K. Clark of Toronto, Dr. Hincks (Secretary) and Dr. C. K. Russel (Chairman of the Committee).

The work of four years was reviewed by the President, the outstanding features showing a most creditable result on the part of the Committee. New psychopathic hospitals had been built in various parts of the country: schools for the feeble-minded and clinics for epileptics established; the immigration laws improved, and the legislation altered to aid in the treatment of mental defectives and the insane.

Various provinces have granted liberally of Government funds to help the work of the National Committee, the western provinces being especially generous in their financial subsidies, *e.g.*, British Columbia has spent about a million dollars on new buildings; Saskatchewan has erected a new Mental Hospital at a cost of a million and a half; Manitoba has made provision for a clinic for the feeble-minded at Portage la Prairie, and is hoping to erect three psychopathic hospitals; Ontario has made a grant of $500,000 for a psychopathic hospital; in New Brunswick a similar institution is promised, and Nova Scotia has given liberally for the erection of two small mental hospitals. It was a regret of the Committee that hitherto the Quebec Provincial Government had been unable to provide money for either psychopathic hospitals or special clinics, but the Committee has approached the Premier with the hope of enlisting his sympathetic interest.

Among the features of the meeting was the address of Lady Byng, who assured the audience that nothing was nearer to her heart than the work of the National Committee.

Dr. Clark and Dr. Hincks set forth their views on the importance of the work of the Committee, and tried to draw the attention of the audience to the need for continued and sympathetic interest.

BRITISH COLUMBIA

The continued efforts of the B. C. Medical Association Executive to unify the profession in this province, have been most successsful. A recent tour of Vancouver Island by the Executive Secretary, in which all towns, north of Victoria, were visited, resulted in every member of the profession in that district joining this Association, not reluctantly, but with avidity. A local subsidiary society was organized with Nanaimo as Headquarters. This Society will be known as 'District Medical Society No. 6. Dr. W. F. Drysdale was elected President, and Dr. T. J. McPhee, Secretary-Treasurer. With the exception of what will be known as District No. 7, that is the Prince Rupert District and points on the G.T.P., east, and a few other outlying places, the whole province has been covered.

The evident sincere desire of the medical men to get together and co-operate, in the real sense of that term, is most gratifying. The welfare of the individual and the profession as a whole, so far as this province is concerned, is being safeguarded, and already much needed reforms, particularly in regard to 'medical contracts' have been, or are being, brought about.

The interests of the Public are not being overlooked, and in this connection a province-wide health campaign has been started. Never in the history of this province has there been a keener desire evinced by the public for information concerning health matters. To supply this want the B. C. Medical Association are devoting the week commencing March 20th, to a series of public meetings throughout the province, when addresses on the following important subjects will be given.—

Tuberculosis, Cancer, Milk, Venereal Disease,
and Preventive Medicine.

This campaign has received the hearty endorsation of public organizations, including the Health Bureau of the Board of Trade, the Canadian Club, the Kiwanis, Gyro and Rotary Clubs; also the Parent-Teachers Associations, the Local Council of Women and many others.

The regular monthly meeting of the Vancouver Medical Association was held on February 13th, when Dr. W. A. Wilson presented a paper on "Aortic dilatation and aneurysm," the result of two years' study of such cases found in returned soldiers under the Soldiers' Civil Re-establishment. Not only did Dr. Wilson merit praise for the labour he had given to his subject, but he showed that aneurysms or dilatation of the aorta could be detected in the early stages and that syphilis was by no means the sole cause of such occurrences.

Two resolutions of some importance were passed by the general meeting, one to the effect that physicians should refuse to write prescriptions for known drug addicts, unless they were confined in a hospital for treatment, and the other that the Pharmaceutical Association be communicated with and that every druggist be requested to telephone the physician for a corroboration of any prescription containing a narcotic. The druggists at a meeting of their association willingly consented to cooperate with the medical men in this particular.

Two clinical meetings of the Vancouver Medical Association were held during the month of February, one at the Hospital for the Insane, New Westminster, and the other at St. Paul's Hospital. Dr. McLellan demonstrated a new technique of skin grafting; Dr. Cunningham showed eye conditions following focal infections; Dr. McKee gave a study of blood chemistry in relation to medical and surgical conditions and Dr. Milburn presented statistics, cases and results of infected abortions.

Obituary

DR. W. T. WALLACE

Dr. W. T. Wallace, one of the best known Surgeons of Western Ontario was found dead in his bed on the morning of February 26th. Dr. Wallace had conducted a large practice for many years. A notice of his death was read at the Academy of Medicine in Toronto on the evening of March 7th, he having been a non-resident Fellow of that organization.

DR. J. W. WOOD

Dr. J. W. Wood, a well known figure in Lindsay, Ontario, died in Lindsay on March 2nd. The deceased was a prominent Orangeman and a Past Master in Masonry. He had been Warden of Victoria County, Mayor of the town of Lindsay, a member of the Board of Education, and was physician to the House of Refuge and the Jail. A good speaker, he was a power in the Conservative ranks, though the unsuccessful candidate against the U.F.O. party in 1919. He was well known as a sportsman and a great devotee of curling.

DR. GEO. A. BINGHAM

Dr. Geo. A. Bingham died in Toronto on March 2nd. A suitable obituary written by one of his old pupils and associates appears on another page of this issue of the Journal. The Editorial Board of the Journal wishes, however, to take this opportunity of saying that, in every matter which required an unselfish interest and which bore directly on the improvement of medical education, of medical standing and ethics, Dr. Bingham was always to be relied upon to express himself forcibly and well, and to follow his sayings by doings. No one member of the Medical Profession will be more missed as physician, teacher, and adviser. His work in the last few years in the cause of the O.M.A. and its expansion, in the re-organization of the C.M.A. is known to everyone. Much of the progress of these organizations has been due to his unselfish journeying here and there in the province. His active interest in the Journal has done much to help put it on its feet in recent months, and his steady support will with difficulty be replaced.

DR. GILBERT HARTIN

At Nelson B.C., on February 3, Dr. Gilbert Hartin, Med, '96, passed away of cancer at the age of 63. A native of Stittsville, Ont., he established himself in practice at Kaslo, B.C., in 1896 and moved to Nelson in 1907. Dr. Martin is survived by his wife, formerly Miss H. Bella Torney, of Richmond, Ont., and by two sons, One of whom is Dr. David Hartin, Med. '14.

DR. A. J. RICHER

The death occurred at Ste. Agathe on Feb. 26-1922 of Dr. A. J. Richer, in his 54th year. Born at Upton, Que., he came to Montreal when a young man and established a successful pharmacy in Pt. St. Charles. Having a keen scientific mind he took up the study of medicine and graduated from Bishop's College in 1892, afterwards going to Europe for post-graduate work. He spent some time in Berlin, Vienna and Cracow after which he obtained an appointment in the Pasteur Institute working as a collaborator with Roux, on diphtheria antitoxin. The first antitoxin used in Canada was sent by Dr. Ricker to one of his medical friends in Montreal.

On returning from Europe his great enterprise and scientific instincts were devoted to the study of tuberculosis. Dr. Ricker was a pioneer in developing the Laurentians as a health resort and established the first tubercular sanatorium in the province at Ste Agathe des Monts. Some years later "Brehmer Rest," the first "preventorium" was established through his efforts as a further step in the fight against the White Plague. He was actively connected with the anti-tubercular league and though of a retiring disposition was a recognized authority not only in this but in other countries. "He was an ever-ready help in time of trouble" and leaves many appreciative patients and friends.

He was unmarried and a member of the Anglican Church.

DR. G. C. READ

The tragic end of Dr. G. C. Read, of Kaslo B.C., was reported on February 13th. It appears that he left Kaslo for Ainsworth on the afternoon of Friday 11th. On Saturday morning it was found that the motor boat he had made use of had not been returned to the boathouse and a search was immediately instituted with all the available craft in the vicinity. Charred wreckage of the launch was found on the shores of Kootenay lake and it is considered that there was an explosion on board the launch shortly after it left Kaslo and that Dr. Read was either burned to death or drowned, the possibility of his having made the shore being regarded as very remote.

Dr. Read, whose age was about forty, came originally from Prince Edward Island and was a son of the late Captain Joseph Read M.P. He was educated at McGill, and had lived in Kaslo ten years. He leaves a wife and two children.

DR. DAVID LABAU

Dr. David LaBau of Victoria, B.C., was found in his office on February 11th with a bullet wound through his head. Dr. LaBau graduated in 1880 from Bellevue Hospital, New York, and commenced to practice in Nelson in 1889 and was the first medical health officer of that city. He moved to Spokane in 1907 and later practised in Victoria.

DR. GEORGE ELLIOTT

Dr. George Elliott was born at Troy, Wentworth County, in November, 1864. Here he lived until the age of ten, when, with his parents, he moved to Culloden, South Oxford. He was an apt scholar, succeeding, at the age of seventeen, in securing a second class certificate, going up for the examination direct from the public school.

In the fall of 1882, he attended Ingersoll Model School as a teacher in training; following this he taught for two years. He then took up a business course and for several years did office work, and, later, became a travelling salesman. In the latter capacity, he travelled a good deal, broadening thus his outlook on life. For some time, medicine was his aim, the teaching and business were but financial stepping stones. In 1891, he began his medical training at Trinity College, Toronto. Following graduation he settled in Toronto, began practice and became a teacher of Anatomy in his Alma Mater. Later, he bought from the late Dr. Beattie Nesbitt, the Dominion Medical Monthly, which he edited and published until last year. For several years he was Secretary of the Dominion Medical Association of the Toronto Clinical Society, and of the Aesculapian Club,—an indication of his willingness to do a good deal of dry unremunerative work for the good of the profession, and also of the confidence and good will of his confreres. He cherished this respect in which he was held by the profession, and lived up to its best traditions.

Dr. Elliott was a conscientious and skillful practitioner. Possessing poise and dignity, he inspired confidence in his patients by whom he was much esteemed, not only for his medical care, but for the many little extra attentions which he was constantly giving them.

Dr. Elliott was a great reader, had a fine memory and was familiar with the best in English literature. He surrounded himself with the world's best books, of which he had many beautiful editions—books it gives me pleasure even to inspect and handle. The contents of these nourished his intellect and fortified his spirit in his upward struggle.

Dr. Elliott's home life was ideal. He was ever a kindly, gentle man, hence was much beloved by wife and sons who greatly mourn his passing. He bore his final months of illness with serenity; for he had "so lived that when the summons came to join the innumerable caravan that moves to that mysterious realm, where each shall take his chamber in the silent halls of death, he went not like the quarry slave at night, scourged to his dungeon, but sustained and soothed by an unfaltering trust, approached his grave like one who wraps the drapery of his couch about him, and lies down to pleasant dreams."

DR. GEORGE. A. BINGHAM

The medical profesion of Canada has lost one of its best known and highly esteemed members in the death from pneumonia of Dr. George A. Bingham. He had been in indifferent health for some months and had been urged by professional friends to take a prolonged holiday in the South in order to recuperate, but unfortunately he was taken ill Feb. 9th, on the eve of his departure. The attack, severe in onset, ran an unexpectedly favorable course; a pseudocrisis occurred; the lung was clearing satisfactorily insomuch that hopes for his recovery were entertained, but symptoms of exhaustion developed; he became comatose and died on March 2nd, 1922.

Dr. Bingham was of Irish parentage, born in Durham County, Ontario, August 28th, 1860. He was educated in the public school and the Bowmanville High School and for some years was headmaster of the Harriston Public School. He entered Trinity Medical College in 1880 and after a distinguished undergraduate career received the degree M.D.C.M. Trinity University and M.B. University of Toronto in 1884. He continued his studies for a time in New York before taking up practice in Toronto. On his return he was appointed Demonstrator of Anatomy by his Alma Mater, which position he held from 1884 to 1889. In 1890 he was advanced to the post of Professor of Practical Anatomy and on the death of Dr. Hugh Robertson in 1892 he was made Professor of Applied Anatomy in succession to Dr. Luke Tesky. He was a member of the Surgical staffs of the Toronto General, St. Michael's and the Hospital for Sick Children and was advanced until he held the position of full surgeon to each. He was for many years Professor of Clinical Surgery in Trinity Medical College and on the amalgamation of the medical faculties of Toronto and Trinity in 1903 he became Professor of Clinical Surgery in the new faculty and chief of one of the surgical divisions of the Toronto General Hospital, positions he continued to hold at the time of his death. He was for a time a member of the senate of the University of Toronto: was a past president of the Ontario Medical Association, the Toronto Clinical Society and the Aesculapian Club of Toronto and a charter member of the Academy of Medicine. He attended the Vancouver and Halifax meetings of the Canadian Medical Association and took an active interest in the reorganization of the Association and placing the Journal on a firm footing. In this connection, he addressed many of the medical societies in Ontario during the past two years.

The writer can remember him since 1888, when as a freshman, he met him as Demonstrator of Practical Anatomy in the old Trinity School. His striking figure and personal magnetism made him a great favorite with the students. He was then, as always, handsome in appearance, the personification of dignity, with a massive head, broad forehead and a countenance expressive of great intellectual capacity.

Dr. Bingham was a brilliant student, a teacher of outstanding force and clearness of expression; a surgeon of the first rank, whose operative work was based on a thorough knowledge of anatomy. He had excellent clinical judgment and was fearless, though conservative as an operator.

He always appeared to the writer to have easily the finest voice and to be the most ready and eloquent speaker in the ranks of the Toronto profession. He was uniformly kindly, courteous, generous and ready to help a confrere and was notably free from academic "loftiness." There was nothing of meanness or pettiness in Dr. Bingham's nature. He had a philosophic outlook on life; was a lover of good literature, an interesting conversationalist and very companionable. In his younger days he was fond of outdoor life, especially fishing, being a member of a noted club on the French River but an accident some years ago resulting in permanent lameness necessitated a less active life. We shall attempt no laudation of his character; the warm place he held in the hearts of his colleagues is an all sufficient tribute.

Book Reviews

THE VITAMINE MANUAL. A Presentation of Essential Data about the New Food Factors. By Walter H. Eddy, Associate Professor Physiological Chemistry, Columbia University. Williams and Wilkins Company, 1921.

No recent biological investigations have been of greater value to dietitians, and to all physicians who undertake to guide mothers and nurses in the best methods of feeding infants than the discovery of vitamines and the part they play in general nutrition. The greater part of our knowledge concerning them has been gained during the past decade. Their importance demands the consideration and earnest study of every physician. In the above volume of one hundred pages the story is told of how they were discovered, of the sources from which they were obtained, of their chemical and physiological properties, and of the diseases that may result from deficiency of them in the dietary of growing children and also of adults. The facts are presented in a very interesting manner, and we cordially recommend the volume to physicians, and to all who have to deal with matters of diet. A. D. B.

1920 COLLECTED PAPERS OF THE MAYO CLINIC, ROCHESTER, MINN. Octavo of 1392 pages, 446 illustrations. Philadelphia and London: W. B. Saunders Company. Cloth, $12.00 net. Toronto, J. F. Hartz Company.

This collection is made up of various papers and addresses prepared by the members of the Staff of the Mayo Clinic during the past year or presented as communications to various medical societies. All have appeared as journal articles previous to their publication in book form. The volume is a splendid contribution to the progress of medicine and surgery, and is an excellent example of book work in its typography, paper and illustrations. We cannot review it nor even undertake to mention the one hundred and twenty-three articles it contains. They relate principally to operative surgery but there are as well numerous medical and pathological studies as well as addresses on medical education. It is a creditable addition to the previous volumes issued. J. H. E.

THE SPLEEN AND SOME OF ITS DISEASES. SIR BERKELEY MOYNIHAN, of Leeds, England. 129 pages with 13 full page diagrams. Philadelphia and London: W. B. Saunders Company, 1921. Cloth, $5.50 net Canadian Agents, The J. F. Hartz Co., Limited, Toronto.

THIS work contains the material upon which the author based his Bradshaw Lecture, delivered at the Royal College of Surgeons of England in December 1920. It gives a surgeon's point of view of the possibilities of splenectomy in diseases of the spleen. There are references to medicinal and radiological treatment as found in the literature, but the author offers practically no personal opinion as to their value, restricting his opinions as to the results of surgical intervention in his own practice and quoting from the Mayo Clinic to such an extent as to almost overshadow his own personal experience. The anatomy of the spleen is first dealt with, followed by a sketch of the history of splenic surgery, and chapters upon the functions and pathology of the spleen. The various diseases are then considered in separate chapters. In pernicious anemia he considers that surgeons should rarely or never find it necessary to operate if the problem is fully and honestly stated to a patient or his relatives. In leukaemia, radium therapy is considered the best available treatment. In Hodgkins' disease it is very doubtful whether splenectomy has any effect good or ill upon the progress of the disease. In Banti's disease the only treatment is splenectomy. It is also to be undertaken in all appropriate cases of haemolytic jaundice. In polycythaemia, the Vaquez-Osler disease, the hypertrophy of the spleen is an attempt to keep the disease in check, and removal is an unsound practice. There is a closing chapter on the relation of the liver to the spleen and a consideration of the value of splenectomy and ligature of the splenic artery in cirrhosis of the liver. J.H.E

THE PSYCHOLOGY OF MEDICINE. T. W. MITCHELL, M.D., Crown, 8 vo pages, VIII, 187. London: Methuen & Co., Ltd. 1921.

A BOOK for those anxious to keep themselves abreast of modern thought in these departments of knowledge. It is principally devoted to a consideration of the doctrines of psycho-analysis dealing with the work of both Janet and Freud. It is not a practice but a presentation of the theories of the subject and an exposition of the principles underlying the psycho-therapeutic methods employed in the treatment of various neuroses.

CLINICAL DIAGNOSIS. A TEXT-BOOK OF CLINICAL MICROSCOPY AND CLINICAL CHEMISTRY. CHARLES PHILLIPS EMERSON, A.B., M.D., Professor of Medicine, Indiana University School of Medicine.
726 pages. 1921, J. B. Lippincott Company, Philadelphia.

WE welcome a new fifth edition of this most excellent work on clinical diagnosis, which was previously revised in 1911 and has been unobtainable for seven years. The first edition appeared in 1906 and at once became the favourite text-book of clinical laboratories over the continent. This edition has been entirely rewritten and reset. Without materially increasing the size of the volume, there are nearly 100 more pages of text than in the first edition while the index has grown from some 2400 items to over 3800. This gives some idea of the amount of new material which has been added. The references to the literature appear conveniently as foot notes and not as tabulated bibliography. Among the new sections added are those on serology, bacteriology and chemistry of the blood and spinal fluid. The author is emphatic in his belief that no physician has the right to entrust his laboratory work entirely to others, that the man who takes the history of the patient and makes the physical examination is the only one who can interpret correctly a laboratory finding. Though primarily intended for the medical student and for the practitioner who wishes to do his own laboratory work, it will enable the busy man to personally supervise or to interpret the laboratory work of others. We congratulate the author upon his successful presentation of modern clinical diagnosis. The work should have the same hearty reception as the former edition. J.H.E.

Principles of Medical Treatment. George Cheever Shattuck, M.D., A.M., Boston. 5th revised edition. 309 pages, one half in blank. W. M. Leonard, Inc., Boston, 1921. Price $3.50.

This is an outline prepared for students at the Harvard Medical School and now slightly enlarged, first appearing as "A Synopsis of Medical Treatment." Most of the chapters are in skeleton form giving bare outlines. Recent unproved treatment is given with that generally accepted. The chapters by Hawes on tuberculosis and by Place on acute infectious diseases of childhood are excellent. As the fifty pages on medication are based principally upon preparations of the U.S. Dispensatory, the book cannot be recommended to students in Canada.

J.H.E.

Manual of Diseases of the Stomach. Wm. McLennan, M.B., Honourary Consulting Physician, Western Infirmary, Glasgow. Published by Edward Arnold & Co., London, 1921.

A Very serviceable book for the student and general practitioner as there is nothing in it beyond the ready comprehension of any reader. An excellent introduction on the physiology of digestion is followed by concise descriptions of the methods of gastro-intestinal investigation. One is pleased to see a proper consideration of both *x*-Ray methods and chemical examinations, and the inference one draws is that the author relies on no one point to the exclusion of others. There is little that is new in the arrangement of gastric and intestinal disorders though this is not to be wondered at since, after all, the number of diseases of the gastro-intestinal tract is not large. Proper stress is laid upon the influence of the nervous system introducing symptoms, and it is well pointed out throughout the volume that the observer takes no count of the influence of emotions in producing symptoms in the gastro-intestinal tract. There are one or two small points which need elucidation, Loewi's Test, the dropping of atropine into the eye to diagnose a disease of the pancreas, and a description of the vagus nerve with sensory endings capable of conducting pain, certainly do not seem in accord with a clear scientific view. There are more than the usual number of printer's errors.

A Half Century of Public Health. Jubilee Historical Volume of the American Public Health Association. Mazvck P. Ravenel, Editor-in-chief, pp. 461 & XI. New York American Public Health Association, 370 Seventh Avenue. Cloth, $5 25; Stiff paper cover, $3 75

A Symposium on Public Health by nineteen leading authorities, this memorial volume purports to be—and is—a remarkable review of the progress of the last fifty years—the kindergarten stage of Modern Public Health.

Canada is represented by Peter H Bryce of Ottawa, an ex-president of the American Public Health Association, and a pioneer public health man in Canada. Of the three other countries having membership in this international association, the United States only is represented by authors in this volume although the Editor, Dr. Ravenel, refers to the many contributions from Cuba and Mexico, and lists their prominent men in public health.

A brief history of Public Health in the United States is given by Dr. Stephen Smith, founder and first President of the American Public Health Association. His book, "The City that Was," has already been reviewed in these columns.

Dr. Ravenel follows with a history of the Association itself, and of its great leaders. Dr. Bryce gives the history of Public Health in Canada, beginning in 1653.

A really first rate history of bacteriology is contributed by Prof. Frederic P. Gorham, Brown University, Providence, R.I.,; of American Mortality Progress by Frederick L. Hoffmann; and of the U.S. Quarantine System by Hugh S. Cumming, Surgeon General of the U.S. P.H.S.

Dr. Charles V. Chapin, the father of Modern Public Health in America, reviews the development of State and Municipal Control of Disease; George C. Whipple treats of water purification, Rudolph Hering of Sewage and Refuse, Earle B. Phelps of Industrial Wastes, Carl S. Alsberg of Food Control, Samuel C. Prescott of Food Conservation, Charles E. North of Milk, Philip Van Ingen of Child Welfare, Lawrence Veiller of Housing, George T. Palmer of Ventilation, George M. Kober of Industrial Hygiene, L. O. Howard of Medical Entomology, Lavinia L. Dock R.N., of Public Health Nursing.

Excellent historically, enlightening as showing the present day status, these articles are distinguished as a group in several ways, of which perhaps the most striking is the admission to Public Health circles, as a definite item worthy of a place in a semi-centennial public health volume, of an article on Public Health Nursing, by a Public Health Nurse. This is a landmark of no small significance.

Almost as significant, but in the opposite direction, is the total exclusion of anything relating to plumbing—an omission which at the beginning of the 50 year period reviewed would have been equivalent to leaving Hamlet out of the well-known play! The word itself occurs but twice—once incidentally, the second time in order to call attention to its disappearance from amongst items of public health interest.

The historical character of these articles does not admit ready quotation of striking conclusions reached. They are more valuable to the general student than to the technician, and still more to the student of history than to the general student.

As records of advances made this volume will always be of interest in itself and a ready source of reference for those preparing material involving reviews of the development in America of specialties in public health.

H.W H

Hormone Therapy—Sera, Vaccines and Drugs. D. Montgomerie Paton, L.R.C.P. et S. Edin., etc. London, Bailliere, Tindall and Cox, 1922. pp. 168. Price 7-6.

According to the Author of this book the basis of the conception outlined is as follows, "all resistance to disease must be at least potentially present in a physiological condition, and that this resistance is developed to meet pathological changes by whatever means these are produced. Hence the foundation of all resistance whether natural or acquired, specific or non-specific must lie in the domain of physiology." "The conception of the production of hormones to meet pathological conditions af, fecting the tissues, and the use of the sera containing them-so that, any one or all of them may be passively transferred to the patient is quite a new departure." "So is also the use of vaccines and drugs for the active production of different hormone balances, which either alone or in conjunction with other treatment are capable of pro-

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ducing results having no relation to the present conception of specific immunity."

The author has elaborated with considerable skill an hypothesis of "tissue resistance" in addition to specific resistance this latter may be natural or acquired. Tissue resistance means "the sum of the effects of hormone action on tissue metabolism." The author states that all his work has been clinical and that he has established to his own satisfaction that by the oral administration of diphtheria antitoxin and a special preparation of normal serum designated 'Hormonin,' (which by the way is so described that it practically falls into the class of proprietary remedies) the 'Hormone balance' can be so adjusted that conditions as dissimilar as neurasthenia and acute appendicitis are most favourably influenced.

It is possible that the therapeutic effects of the oral administration of diphtheria antitoxin, normal serum, and certain alkaloids have been overlooked, but this exposition is so hypothetical and so lacking in experimental data that not much weight is likely to be attached to the arguments advanced by Paton supporting such a view. Physicians in the United States and Canada are not likely to be favourably impressed by an author who describes one of his therapeutic agents in the following way— p. 41 "the usual normal serum is not suitable for this purpose, for it will not keep good (!) if exposed, as would be necessary in a mixture. To overcome this I made some suggestions to Messrs. D— and S—, manufacturing chemists of M— and by long and careful experiments they have materially improved on these suggestions, and have produced a preparation called 'Hormonin', which fulfils all the requirements of such a product"— This, it would seem, is very nearly advocating the use of a nostrum, the exact nature of which is left to the reader's imagination.

J.G.F

AIDS TO FORENSIC MEDICINE AND TOXICOLOGY. W. G. AITCHISON ROBERTSON, M.D., D.Sc., F.R.C.P.E. Ninth ed., 1922. Fscp. 8vo. Pages xii 155. Bailliere, Tindall and Cox, London. Price 3-6.

THIS little book, a continuation of that written by Murrell, can be strongly recommended to all practitioners and students. It is well written, complete and concise, but is by no means so abridged as to be of little value. With this book alone as guide, the physician would find himself sufficiently posted to appear in court in any type of case, unless he were to give expert evidence on points in chemical toxicology or some other purely technical field. Any practitioner not possessing a book on Forensic Medicine would be well advised to purchase this moderately priced volume.

V.E.H.

1920 COLLECTED PAPERS OF THE MAYO CLINIC, Rochester, Minn. Octavo of 1392 pages, 446 illustrations, Philadelphia and London. W. B. Saunders Company. Cloth, $12.00 net. Toronto, J. F. Hartz Company.

THIS collection is made up of various papers and addresses prepared by the members of the Staff of the Mayo Clinic during the past year or presented as communications to various medical societies. All have appeared as journal articles previous to their publication in book form. The volume is a splendid contribution to the progress of medicine and surgery, and is an excellent example of book work in its typography, paper and illustrations. We cannot review it nor even undertake to mention the one hundred and twenty-three articles it contains. They relate principally to operative surgery but there are as well numerous medical and pathological studies as well as addresses on medical education. It is a creditable addition to the previous volumes issued.

J.H.E.

Books Received

The following books have been received and the courtesy of the Publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

The Relations of Tuberculosis to General Bodily Conditions and to Other Diseases—The first Mitchell lecture on Tuberculosis, delivered on Nov. 1st, 1921, before the Royal College of Physicians, London, with an appendix on Literature relating to the subject of so-called spontaneous idiopathic pneumothorax, etc. By F. Parkes Weber, M.A., M.D., F.R.C.P. Publishers: H. K. Lewis and Co., Ltd., 28 Gower Place, London, W.C.I., Eng., 1921. Price, 2s. 6d. net. paper covers. 27 pages.

Aids to Forensic Medicine and Toxicology By W. G. Aitchison Robertson, M.D., D.Sc., F.R.C.P.E., Ninth Edition. 155 pages. Price, 3s. 6d. net. Published by Belleire, Tindall and Cox, 8 Henrietta Street, Covent Garden, London, Eng., 1922.

Hormone Therapy By Sera, Vaccines, and Drugs—By D. Montgomerie Paton, L.R.C.P. et S. Edin., etc. 168 pages. Price 7s. 6d. Published by Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden, London, Eng., 1922.

The Evolution of Modern Medicine. A series of Lectures delivered at Yale University on the Silliman Foundation in April, 1913. By Sir William Osler, Bart., M.D., F.R.S. Publishers: New Haven Yale University Press. 1921, $7.00.

The Treatment of Common Female Ailments—By Frederick John McCann, M.D., Edin., M.R.C.P., London, F.R.C.S., England. 145 pages. Price 8s. 6d. net. Published by Messrs. Edward Arnold & Co., 41 Maddox Street, London, W.I., England, 1922.

Lessons on Tuberculosis and Consumption—By Charles E. Atkinson, M.D., 12 mo, Cloth, 470 pages. Price $2.50 net. Published by Funk & Wagnalls Company, New York, 1922.

The Mechanics of the Digestive Tract—Walter C. Alvarez, M.D. 192 pages with twenty-two illustrations. Price $3.50 net. Published by Paul B. Hoeber, New York, 1922.

Treatment of the Neuroses—By Ernest Jones, M.D. 8 Henrietta Street, Covent Garden, London, Eng., (Lond.) M.R.C.P. (Lond.). 233 pages. Price 10s. 6d. net. Published by Bailliere, Tindall and Cox, 1920.

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Ephraim McDowell—"Father of Ovariotomy" and Founder of Abdominal Surgery; with an appendix on Jane Todd Crawford. By August Schachner, M.D., F.A.C.S., Publishers: J. B. Lippincott Company, Philadelphia and London. 1921. 314 pages, illustrated.

Collected Papers on the Psychology of Phantasy—By Dr. Constance E. Long, Late Senior Assistant Elizabeth Garrett Anderson Hospital; Late Medical Officer, Education Board and Ex-President Association of Registered Medical Women. 216 pages. Price 10s. 6d. net. Publishers, Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden, London, Eng., 1920.

Exophthalmic Goitre—A Lecture delivered at the North East London Post Graduate College, April 27, 1921, By Walter Edmunds, M.A., M.Ch.Cantab., F.R.C.S. 36 pages, 4 plates. Price 3s. 6d. net. Published by Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden, London, Eng., 1921.

A Half Century of Public Health—Jubilee Historical Volume of the American Public Health Association. Edited by Mazyck P. Ravenel, M.D., Published by the American Public Health Association, New York, 1921. 461 pages. Cloth. $5.25. Paper, $3.75.

International Clinics—A quarterly of illustrated clinical lectures and especially prepared original articles on treatment, medicine, surgery, neurology, pædiatrics, obstetrics, gynæcology, orthopædics, pathology, dermatology, ophthalmology, otology, rhinology, laryngology, hygiene, and other topics of interest to students and practitioners, by leading members of the medical profession throughout the world. Edited by H. R. M. Landis, M.D., Philadelphia, U.S.A. Volume IV. Thirty-first series, 1921. Illustrated. 300 pages. Published by J. B. Lippincott Company, Philadelphia, Pa., U.S.A.

Mentally Deficient Children—Their Treatment and Training—By G. E. Shuttleworth, B. A., M.D., and W. A. Potts, M.A., M.D. Fifth Edition, 320 pages; Illustrations 29, including 21 plates. Price 10s 6d net. Published by H. K. Lewis & Co. Ltd., 28 Gower Place, London, W.C.1 1922.

Medical and Surgical Reports of the Episcopal Hospital—Volume V. Edited by Astley P. C. Ashhurst, M.D. 502 pages; illustrated. Published by Wm. J. Dornan, Philadelphia, 1920.

The City that Was—By Stephen Smith, A.M., M.D. LL.D. 211 pages. Published by Frank Allaben, 3 West Forty-second Street, New York, N. Y.

Protein Therapy and Nonspecific Resistance—By William F. Petersen, M.D., with an introduction by Joseph L. Miller, M.D. 307 pages. Published by The MacMillan Company, New York, 1922.

L'Encephalite Lethargique—By Le Professeur Achard, with 15 illustrations. Published by Librairie J. B. Bailliere et Fils, 19, Rue Hautefeuille, 19. Paris. 1921.

Clinical Electrocardiography—By Frederick A. Willius, M.D. Section on Clinical Electrocardiography, The Mayo Clinic, Rochester, Minn., and the Mayo Foundation, University of Minnesota. Octave of 188 pages with 185 illustrations. Philadelphia and London. W. B. Saunders Company, 1922. Cloth $5.50 net. J. F. Hartz Co. Limited, Toronto.

Papers from the Mayo Foundation—For Medical Education and Research and the Graduate School of Medicine of the University of Minnesota, covering the period of 1915-1920. Octavo volume of 695 pages with 203 illustrations. Philadelphia and London; W. B. Saunders Company, 1921. Cloth $11.00 net. J. F. Hartz Co. Limited, Toronto.

Neoplastic Diseases—A treatise on Tumors, by James Ewing, M.D., Sc.D. Second Edition, revised and enlarged. Octavo of 1054 pages with 514 illustrations. Philadelphia and London, W. B. Saunders Company, 1922. Cloth $13.25 net. The J. F.Hartz Company, Limited, Toronto.

Psychoanalysis: Its Theories and Practical Application. By A. A. Brill, Ph.B., M.D. Third Edition, thoroughly revised. Octavo of 468 pages. Philadelphia & London; W. B. Saunders Company, 1922. Cloth $5.50. The J. F. Hartz Co. Ltd., Toronto.

The American Illustrated Medical Dictionary—Eleventh Edition, revised and enlarged. A new and complete dictionary of terms used in medicine, surgery, dentistry, pharmacy, chemistry, veterinary science, nursing, biology, and kindred branches, with new and elaborate tables. Edited by W. A. Newman Dorland, M.D. Large octavo of 1229 pages with 338 illustrations, 141 in colors; containing over 1500 new terms. W. B. Saunders Co., Philadelphia, 1921. Flexible leather, $7.75 net; thumb index, $8.75 net. The J. F. Hartz Co. Ltd. Toronto.

Fifty-Third Annual Meeting

Canadian Medical Association

WINNIPEG, JUNE 20th to 23rd, 1922

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The Canadian Medical Association Journal

Vol. XII TORONTO, MAY, 1922 No. 5

CLINICAL LECTURE. CARCINOMA OF RECTUM*

A. T. Bazin

Assistant Professor Surgery and Clinical Surgery, McGill University

Attending Surgeon Montreal General Hospital

I DESIRE to bring to your attention two cases which have some points of similarity but other striking features which are dissimilar. You will perceive that in both patients an inguinal colostomy has been performed at some prior date, and it is my intention to unfold the conditions in each individual which demanded this interference; also to emphasize some lessons which you should never forget.

Case No. 1 has a history which in short is as follows: a French-Canadian farmer aged 34 was admitted Jan. 25 complaining of abdominal distention and an inability to obtain a movement of the bowels during the previous six days. On Jan. 19 he first had some abdominal pain and the bowels did not move. On Jan. 22 he had increased pain, some vomiting, and he took to his bed. He vomited many times on the 23rd, and 24th a dark greenish material.. He had partaken of no food since Jan. 21st.

His past history is one of perfect health (with the exception of tonsilitis four years ago) until April 1921 when he noticed he was constipated, having previously been quite regular. Since April 1921 he has had four attacks, characterized by abdominal pain, vomiting, and obstinate constipation. These attacks confined him to his bed for 3 to 4 days. He states he has lost neither weight nor strength.

On the day of admission he was quite free from pain but had marked abdominal distension with obliteration of liver dullness. The abdomen was tympanitic throughout, but was not tender nor rigid. A rectal examination was negative. Other systems were negative. The tongue was moist; the general condition good; his temperature was 98 2-5F, his pulse 88; the leucocyte count was 18,500. An enema was given and was returned slightly effectual with some flatus. On Jan. 26th, the day after admission, the enemata given had the same result without, however, any decrease in the distension. On the following day (Jan. 27) vomiting supervened light brown in colour with fecal odour, and the enemata were returned clear. Intestinal obstruction of unknown situation was the diagnosis, and laparotomy was performed by Dr. Eberts, who finding an annular scirrhus carcinoma of the upper part of the rectum, performed an inguinal colostomy as a life-saving operation.

Now in the light of this definite knowledge regarding his condition let us analyse the history:-

1st. His age was 34 years. I can see you are surprised that carcinoma should occur in one so young. It is true that this is somewhat unusual but I want you to remember that carcinoma, although more common after 45, does occur in the young; and carcinoma of the rectum occurs more frequently at a comparatively early age than does carcinoma of any other organ.

2nd. The leucocytosis was 18,500. I can explain this only by the probability of there being ulceration of the mucous surface of the cancer with septic absorption therefrom.

3rd. The history of the sudden development of constipation in one previously regular, the occurrence of recurring crises of abdominal pain with vomiting and obstipation should have gained for this man a routine examination which would have cleared up the diagnosis long before his life was endangered by the onset of acute intestinal obstruction. You have repeatedly been told that the only way to successfully combat carcinoma is by early diagnosis followed by prompt and radical operation. It is almost a year since this patient gave signs of serious mischief and during that time the cancer has been extending, slowly but surely.

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* Delivered to the Class in Medicine, March 16, 1922.

Case 2. presents an altogether different picture. X. Y., male, aged 61; also a farmer, was admitted February 15 complaining of constipation, bleeding from the rectum, and loss of weight and strength. His past history was one of uninterrupted health but he has been constipated for years, and for 20 years has had "piles" for which he has continuously employed salves and has had bleeding on several occasions.

In June, 1921, his constipation became more obstinate and he noticed pain during defecation accompanied by the loss of bright red blood. Since that time he has been continuously troubled with the desire to defecate 8 to 12 times daily, passing very little fecal material but considerable flatus and small amounts of offensive dark bloody mucous. He has lost 20 lbs. in weight since June 1921 and has weakened progressively. He has had some frequency of, and pain upon, urination for two years but this pain has been much more severe during the past two months. In November, 1921, he consulted a physician who omitted a rectal examination but prescribed suppositories and recital douching

On admission he showed some signs of cardiovascular change: i.e., thickening of radial arteries; cardiac enlargement to left, He.m.; faint trace of albumin in urine; systolic blood pressure 160.

Rectal examination shows the anal canal to be normal, but immediately upon entering the ampulla the finger encounters a deep ulcer which is extremely tender and bleeds freely from the manipulation. The tenderness precludes a thorough examination, but from the history, and such examination as is possible a colostomy is determined upon, at the same time a more complete investigation of the local condition can be carried out.

Colostomy was performed the following day. While the patient was under the anaesthetic the rectum was again examined. A large excavating ulcer was found on the anterior surface of the rectum. It had soft friable edges, was raised considerably above the level of the surrounding surface and infiltrated the neighbouring tissues for some distance. A narrower ulcerating area was also present on the lateral and posterior wall almost encircling the lumen of the gut. There was marked fixation of the base of the ulcer anteriorly to the structures about the prostate and base of the bladder. A portion of the edge of the ulcer came away on the finger, which histologically showed the structure of an adenocarcinoma.

The colostomy was performed through a split muscle incision enlarged by splitting the anterior sheath of the rectus transversely and retracting the rectus muscle and deep epigastric vessels medially. This, while it allows the introduction of the hand for exploration, also permits of closure without an undue weakening of the abdominal wall or a laxity of the wall about the colostomy loop. Exploration in this case revealed no metastases in liver or retroperitoneal glands nor any involvement of the peritoneal surface in the pelvis.

After the colostomy was performed the bleeding completely stopped; there having been only 2 or 3 small discharges per anum; the pain in the rectum almost ceased, the tenderness was much less and on examination there was less fixity of the mass anteriorly.

Carcinoma per se is a painless condition, notwithstanding the popular belief. The pain and tenderness are due to complicating conditions; in this instance to secondary septic infection of the peri-rectal tissues through the open ulcer, and to the repeated trauma of frequent straining attempts at defecation. A colostomy places the rectum under conditions favourable to complete rest, hence the subsidence of the signs of secondary inflammatory infiltration; i.e., pain, tenderness, size, and fixity to contiguous structures.

The lesson I wish to drive home from a study of this case is the necessity of a rectal examination in all patients who consult you regarding painful defecation, with or without bleeding. A digital examination at least, but if that fail to reveal the source of the trouble then a proctoscopic or other method of examination until the condition is truly interpreted.

Now, what about the prognosis in these two cases provided radical operation for removal of the growth is performed. Case 1 has a scirrhus carcinoma, with little or no ulceration and no evidence of metastasis. Case 2 has a soft adeno-carcinoma with extensive destruction but also with an undoubtedly rapid extension, although with no evidence of metastasis.

Taking an analogous condition in the breast, a scirrhus and a soft medullary carcinoma, we know that the latter is much more rapid in its spread both locally and to the glands, but a scirrhus of the breast can be detected much more early than can a scirrhus of the rectum. In the latter situation it gives no signs until those of obstruction supervene, as exemplified in Case 1, and inasmuch as a scirrhus develops those signs of obstruction not because of the size of the mass but because of the cicatricial contraction in the fibrous tissue which is such a marked element in scirrhus cancer anywhere; and inasmuch as we know that organization of fibrous tissue and cicatricial contraction of the same is a very slow process, we must infer that the carcinomatous cells (which primarily by their presence stimulate the formation of fibrous tissue in the scirrhus type) have been present for a much longer period of time than denoted by the onset of symptoms. And because extension and metastasis bear a definite relation to the length of time carcinoma has been present we must conclude that in carcinoma of the rectum the scirrhus type has a more unfavorable prognosis than has the soft adeno-carcinoma with its early ulceration and bleeding attracting attention. This conclusion is borne out by statistics.

To recapitulate the lessons to be drawn from these cases; to point the moral as it were:-

1. Carcinoma of the rectum is not uncommon in individuals of a comparatively early age.

2. Abdominal crises must not be permitted to pass unexplained.

3. Rectal bleeding and painful defecation demand such an examination as will satisfactorily explain the cause.

4. In carcinoma of the rectum the scirrhus type has a more unfavorable prognosis than has the soft adenomatous type.

AORTIC DILATATION AND ANEURISM*

Wallace Wilson, B.A., M.B.

Vancouver, B. C.

DURING the last two and a half years I have examined for the Department of S. C. R. a considerable number of ex-soldiers and have found amongst them a certain percentage suffering from disease of the thoracic aorta as manifested subjectively by certain well or ill defined symptoms, and objectively by a dilatation of some part of that division of the aorta. This dilatation, has, in some, been slight, in others, well defined or marked, and, finally, in a third class there has been present an aneurysm either fusiform or saccular in character. In the early months of the work it was noted that amongst these cases some men came up for examination in whom the clinical signs were clear and the cause apparent, while in others the signs were slight or absent and a definite explanation of the symptoms complained of was only given by the X-Ray. It resulted then that every patient appearing for examination of the chest was gone over carefully, with the idea of a possible aortitis in mind, and it is the incomplete results of this search that are to be presented. According to *Brown*, (1) the normal aorta of a young adult man should measure from five to seven cms. in the transverse diameter, the maximum width extending to 8 cms. after 50 years of age, while the measurements are somewhat less in women. *Peter*, (2) gives the transverse dullness of the aortic and pulmonary trunks together, as about two inches and states that in chronic aortitis the width may exceed three inches. *Smith* and *Kilgore*, (3) in an X-Ray study of the aorta found that 4.5 to 5.5 cms. included by far the largest number of normal measurements in their series and in every case measuring more than 6 cms. there was definite contributary evidence pointing to aortitis. It is evident that many factors have to be taken into consideration in analysing these measurements, particularly the size and general build of the subject and what is "dilatation" for one man is normal for another. *Brown*, gives a spread of two centimetres to cover this and adds another for a man's declining years. To eliminate all doubt as to a real and definite dilatation in this series numerous examples classified as "slight" have been excluded. In only three cases do the measurements fall below 8 cms. and these were cases of men of small build with small so-called "drop hearts" and aortas that were definitely abnormal. Including these the average transverse measurement of the thoracic aorta in its widest portion as taken from the X-Ray plate or fluoroscopic tracing, in 36 cases was 9.84 cms. The series comprises 36 cases, all of the male sex; in some instances physical signs were absent; in others the condition was latent; but in all the final diagnosis was either confirmed or made by means of an X-Ray examination.

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From this group, confined with one exception to ex-soldiers, no information can be obtained as to the relative frequency of aortic dilatation and aneurysm in the general population and reference to the literature, obtains only figures concerning aneurysm.

(1) In 24,363 admissions to Johns Hopkins, there were 204 Thoracic Aneurysms—or nearly one per hundred. (4)

(2) At the Charity Hospital, Tulane, one case out of every 300 was suffering from aneurysm, and of the Post-mortems held at the same institution, one in thirty showed aneurysm. (4)

(3) *Turnbull*, (5) in a series of 114 unselected autopsies found aneurysm clinical or academic in 20 per cent.

(4) In the X-Ray Department of the Vancouver General Hospital, in the years 1918-1921, inclusive there were 3,155 chest examinations made and of these 178 or 5.64 per cent showed signs indicative of dilatation or aneurysm of the thoracic aorta. Of the total of 178 cases there were 137 cases of dilatation and 41 cases of aneurysm.

AGE:—The age of the patients was noted in all cases and works out as follows:- Between 31 and 40 years there were 5 cases or 13.5 per cent; between 41 and 50 years there were 16 cases or 44.4 per cent; between 51 and 60 years there were 12 cases or 33.3 per cent; between 61 and 70 years there were 3 cases or 8.3 per cent. The youngest was 31 years of age, the eldest 64, and the average 48.5 years. These figures show a predominating incidence of the condition in the men between the ages of 40 to 60 years.

OCCUPATION:—In considering occupations it must be remembered all patients spent on an average of from 2 to 4 years on active service, prior to the summer of 1919, since which time the majority have been partially or wholly disabled and have not engaged in heavy labor. The pre-war occupations fall into three classes:- (1) Heavy manual, 18 cases, or 50 per cent; (2) Light manual, 12 cases, or 33.3 per cent; Sedentary, 6 cases, or 16.8 per cent.

AETIOLOGY:—Every vascular system inherits a certain standard of quality of the tissues and a certain standard of resistance to what may be called general wear and tear, and to all other inimical influences that are to a greater or less degree constantly at work. This heritage is an important consideration to be weighed in giving a prognosis in any case. In some families the arteries degenerate early, in others late in life.

In addition to this hereditary or intrinsic tendency to degeneration in the arterial walls there is another important group of causes namely the organic and in-organic poisons which may directly attack the arterial tissues, and in the aorta may provoke an acute or chronic aortitis. Among these the poison of syphilis calls for our most important consideration.

SYPHILITIC AORTITIS:—Not all dilated aortas are the seat of a syphilitic invasion nor is every aneurysm due to the Spirochoeta Pallidi, but it is undoubtedly true that the greatest single factor in producing an infective aortitis is syphilis. Furthermore, *Turnbull*, (6) found that specific aortitis was by far the most constant lesion found in syphilitics at autopsy, and *Hubert*, (7) concludes that aoritits comprises 70 per cent of all visceral lues. The onset may be acute and may be separated in time by a surprisingly short interval from the primary infection. *Brooks*, (8) records a case of rupture of an aneurysm before the secondary rash had fully appeared, and in another case there was dilation within seven months of the primary lesion. However, in the vast majority a lapse of silent years intervenes between the introduction of the cause and the late effect on the aorta as found in clinical and X-Ray examination. The end product in a large number is dilatation or aneurysm with or without cardiac complications and at that stage prognosis as regards duration of life is bad.

ACUTE AORTITIS: *Dieulafoy*, (a) was of the opinion that primary acute aortitis did not exist per se, and that acute inflammation of the aorta secondary to the infectious diseases was excited in proportion to the extent of the chronic lesions already implanted in the wall of that artery. On the other hand there is on record the observations of many astute clinicians and accurate pathologists, to show that acute inflammatory changes involving the whole or part of the aorta are definitely of not infrequent occurrence. *Broadbent*, (10) found what he considered small areas of acute degeneration in the aortas of children dying from pneumonia, Septicaemia or some acute bacterial infection. *Allbutt*, (11) considers acute aortitis as of not infrequent occurrence in children suffering from acute rheumatic fever. *Klotz*, (12) found small areas of aortitis at autopsy in children dying from the same cause, and *Norris* and *Landis*, (13) picture in their text-book, a portion of an aorta from a woman dying of septicaemia following abortion, in which is shown extensive areas of fatty degeneration. *Priminger*, (14) in a fleuroscopic study of the heart and aorta, in cases of war nephritis found in the acute stage a dilatation of both organs and a later observation indicated that there was, in the majority, a return to normal dimensions as the disease subsided. Whether the dilatation was due to elevated blood pressure, to toxaemia, or to both it is impossible to do more than surmise but it was probably the result of the action of both factors. At the present time one can but question the fate of all aortas, the seats of acute inflammation. In some there is apparently complete resolution without secondary degenerative processes. In others the acute condition fades into a chronic lesion that advances slowly and insidiously, accompanied frequently by a gradual widening of the vessel's lumen and not rarely hastened onwards by the shock of acute exacerbations or the added insult of an acute attack originating from an entirely new aetiological source. The acute infections responsible most frequently for aortitis are typhoid fever, influenza, rheumatism, small pox, and the septicameas. It also may occur after the infection of measles, diphtheria, malaria, gonorrhoea, scarlet fever, and possibly pneumonia.

CHRONIC AORTITIS:—The enemies responsible for an acute aortitis may continue to operate a chronic trench warfare after the first open fighting has subsided, but there are in addition numerous arterial assailants who go over the top without any preliminary bombardment, dig themselves in unobtrusively, fight silently and insidiously, and when finally in at the death may even then be unrecognized by the stretcher bearers present. One can but indicate their strength. (1) *Chemical Poisons*: such as lead; (2) *Faulty Metabolism*: such as frank diabetes or those cases of hyperglycemia with a high threshold for sugar and only intermittent glycosuria, dis-function of the endocrine glands, such as Graves' Disease, and the so-called rheumatic and gouty states. (3) *Kidney disease.* (4) *Toxaemias* from such conditions as chronic constipation and low grade bacterial infections, general and local. (5) *Excesses in eating and alcohol.* (6) *Faulty or inadequate exercise.* (7) *Physical and mental strain.*

The list is obviously incomplete but some conception may be obtained of the complexity of the problem. It is doubtful if a static so-called dynamic dilatation ever occurs in a perfectly healthy aorta no matter what the blood pressure is. Long continued hypertension, however, will produce some hypertrophy of the aortic wall with sclerosis, and a resultant reduction in the blood supply will cause further degeneration and dilatation. The aortas of two cases in the series coming to autopsy did not exhibit the degree of dilatation presented on the screen and resiliency was not entirely lost, but the walls were undoubtedly both dilated and the seat of degenerative changes. In one the systolic blood pressure before death was 150, in the other 210.

No case of the present series was seen in an attack of acute aortitis. In all the disease had been of considerable standing and symptoms date back over a year at least. In the majority a search for the definite aetiological factor gave disappointing results, and conclusions in many can only be speculative. A blood Wassermann reaction was done on 32 cases. In 19 or 59.3 per cent it was negative in both antigens. In 7 or 21.8 per cent in was positive with cholesterin only. In 6 or 18.7 per cent it was frankly positive in both antigens. Of the 26 cases that were negative in both antigens or positive in cholesterin only, 22 had the Wassermann repeated one or more times, but in no case was an acetone positive obtained, and this includes a few who received a provocative dose of neo-diarsenal. A definite history of syphilis was obtained in six cases and their blood Wassermanns were positive with one exception, where it reacted with cholesterin only. In one case in which a venereal history was denied the blood Wassermann was positive. No history of syphilis was obtainable in 25 cases and in these there was a negative acetone antigen reaction. A definite aetiology that excluded syphilis was found in three. Let me briefly enumerate them because they are important.

(1) *D.M.F.*, a man 45 years of age, of large and generous build, weighing 230 lbs. and by trade a merchant, gave no history of any illnesses prior to enlistment in the army. While on active service he contracted acute rheumatism and spent eight months in hospital in England, running a high fever for a prolonged period with cardiac involvement. At one time he was on the dangerously ill list or to quote the man's own words "they put a screen around me and sent for a padre." He was finally invalided to Canada and spent two years in various hospitals, suffering from an obstinate, chronic rheumatism that confined his activities to crutches. On examination at the present time he shows no evidence of valvular disease, but a marked myocarditis with enlargement of the heart, extra systoles, and tachycardia is present. The aorta shows considerable dilation of the whole arch. B.P. Systolic 150-145; Diastolic 110.

(2) *C.O.D.*, a retired army officer, weighing 135 lbs. joined up early in the war and was given a responsible post in the Pay Department. As far as can be obtained from the man he had a clean bill of health, up to November 4th, 1918, when he contracted influenza and went through a severe course of that disease. While convalescing and while still weak and unfit for duty he was induced by pressure of work in his department to return to his desk. In January 1919, a short two months after the onset of the acute infection, he broke down completely and was sent to hospital with a diagnosis of "Valvular disease of the Heart." Since that time he has been a total disability and present examination shows a pale sickly looking man, who suffers from severe dyspnoea, violent palpitation, and pain over the heart if he attempts anything more than a very slow walk. There is moderate clubbing of the fingers, occasional oedema of the feet and ankles and all the signs and symptoms of a heart that is laboring continuously on the verge of decompensation. Examination further shows marked aortic regurgitation, slight left sided hypertrophy and a notable dilatation of the whole aortic arch, most marked in the ascending portion. B.P. Systolic 145. Diastolic 50.

(3) *W. J.*, a man 41 years of age and slight build was a plumber up to the time of his enlistment early in 1915. Excluding the diseases of childhood no history of any illness prior to joining the army could be elicited. He stood his training well and was duly sent overseas. In the Autumn of 1916, he contracted rheumatic fever with high temperature, sweats, and an involvement of most of the large joints. He spent 4 to 5 months as a strict bed patient and has been in hospital continuously up to date. Towards the end of 1917, he commenced having pain over the heart, dyspnoea on slight exertion, pain in the back, and, at times, a sense of pressure in and constriction around the chest. These symptoms have gradually become aggravated until the man is again a bed patient who presents on examination a heart that is not appreciably enlarged, either clinically or on X-Ray examination, definite signs of aortic regurgitation, and a saccular aneurysm involving the transverse and descending portions of the thoracic aorta and occupying most of the upper portion of the left chest. B.P. is left Systolic 170, Diastolic 72 and right Systolic 150, Diastolic 50. In the remaining 22 cases no such dramatic cause and effect relationship could be found, but a definite history was obtained of the following conditions: chronic rheumatism or myalgia in six cases, typhoid fever in four and tuberculosis of the lungs in a like number. Influenza, malaria, chronic appendicitis, gonorrhoea and an unidentified fever, twice; there was one

example each of chronic constipation, diphtheria, and haemoglobinuria. In four cases the previous history was entirely negative.

It is noted that a history of the diseases of childhood was largely absent due unfortunately to the fact that no special enquiry was made concerning them, and that by the patients they were usually considered as of no importance. In no case was there a history of smallpox and in no case past or present was there definite evidence of any disturbed or altered function of the thyroid gland. The urine was examined more than once in all cases, but sugar was found in only one; in this one there was an intermittent glycosuria without hyperglycaemia and without retention following a glucose tolerance test. It is regretted that work was not done on the functional powers of the kidney in these cases. There was no case in which nephritis had been previously diagnosed but several showed albumen and casts in the urine and should have been investigated further. A history of excess in alcohol was difficult to obtain but it had evidently been present in a few.

In these 25 cases with negative Wassermanns or with cholesterin positive reactions only, no history of syphilis could be obtained nor were there any clinical evidences of the same. It is granted that in only 88 per cent was the Wassermann reaction done on the blood more than once and in only 15 per cent was a lumbar puncture performed, but it is submitted on the evidence given, that the majority were not suffering from syphilis. *Brown*, (1) states that 75 per cent of the cases of syphilitic aortitis give a positive Wassermann, *Larkin* and *Levy*, (15) put the percentage at 94, and *Longcope*, (16) is of the opinion that 85 to 95 per cent of all aneurysms give a positive Wassermann. Turnbull, (5) on the other hand found as follows in a series of 114 unselected postmortems in which ante-mortem blood Wassermann reactions had been performed. Aneurysms clinical or academic were found in 5 cases giving negative Wassermanns. In 4 the lesion was a medial degeneration non-luetic in character. In the fifth there was tuberculosis. During life and at autopsy this case was considered syphilitic in spite of a negative Wassermann, but on microscopical examination tubercle bacilli were found in the wall of the aneurysm and in adjacent lymph glands. In 18 cases, clinical or academic aneurysms due to syphilis were found and all cases had given a positive Wasserman. In one case only, was there found syphilitic aortitis with a negative Wassermann and in this case there were only one or two small patches exhibiting practically no signs of activity. There were 8 clinical and 10 academic aneurysms due to syphilis and 2 clinical and 3 academic not due to syphilis. This gives a percentage of 8.7 for clinical and 11.4 for academic aneurysms; a total of 20 per cent. *Turnbull's* work was a histological study instituted at the London Hospital at the request of the Medical Research Committee, in order to check up ante-mortem blood Wassermann findings. His conclusion at the end of an undertaking which entailed the critical examination of thousands of microscopical sections was that "The Wassermann reaction, at least, in the hands of such experts as *Fildes* and *McIntosh*, is a diagnostic weapon of astonishing precision."

Detailed post-mortems only, will give the final logical answer as to the aetiology in these cases. Even in the syphilitics while the grounds for an assumption that the aortitis is due to the spirochaeta pallida are strong, they are, nevertheless, not unassailable and the likelihood of the presence of other factors working either alone or in conjunction with the syphilitic virus must be held as possible. To date four patients have died and gone to autopsy, but unfortunately in none of them were sections of the aorta made. One was a coroner's case, and only information as to the cause of death was obtained. One gave a history of lues with a positive Wassermann and macroscopically the lesions were syphilitic. In the remaining two there was no history of syphilis, no clinical evidence of the same, and the Wassermann in both was negative on more than one occasion. On gross examination the aortic walls were the seats of a non-specific atheroma.

Before detailing signs and symptoms it is necessary to emphasize the fact that one or the other may be absent, not infrequently both. *Broadbent* has discussed "The Aneurysms of Signs" and "The Aneurysms of Symptoms," but a chronic aortitis may run its course to dilatation or aneurysm and no evidence of same be obtained from the patient's history, or the clinical examinations. *Letulle*, (17) X-Rayed as a routine for three years all chronic invalids and found 27 latent aneurysms. *Baetger*, (18) in a series of 104 aneurysms found 5 per cent accidentally by X-Ray.

Therefore, in the diagnosing of all obscure chronic cases it is incumbent on the examiner to thoroughly investigate the vascular system, not omitting the taking of an X-Ray plate of the chest.

Symptoms—An analysis of the symptoms complained of presented certain difficulties because of the frequent presence of concomitant cardiac disease. Myocarditis was found eight times, aortic regurgitation alone was present in five cases, it was associated once with mitral regurgitation and in one case the only valvular lesion was mitral regurgitation. Hypertrophy without clinical evidence of valvular disease or myocarditis was encountered in six men. The symptoms can be grouped widely under two heads; (a) those which suggest angina and (b) those which would primarily cause attention to be drawn to the heart. Only one case, however, gave the bold text-book picture of angina pectoris and there was only one example of a heart continually hanging over the precipice of failure. It will be seen that some of the symptoms complained of occurred in a large percentage of cases including those in which no clinical evidence of valvular defects or myocarditis could be obtained, but it is admitted that in many it is impossible to allocate the symptoms to the particular anatomical lesions present. In many there is a combination of causes and it is proposed, therefore, to consider the symptoms for the whole group without any attempt at differentiation, merely noting that *Allbutt*, (19) has stressed the point that in disease of the aorta, particularly the root, you may get severe pain, and at autopsy there will be no evidence of coronary involvement.

Pain occurred in 82.8 per cent of the cases and was the predominating single symptom of the series. It varied from a slight sense of discomfort present only on exertion, or, on certain changes of posture to a persistent pain that was constantly present, or to attacks of agonizing pain that were only possible of support because of their short duration. One man described his pain as being similar to the sensation he would have if someone suddenly poured a bucket of scalding water over his left side from above downwards. The location was most frequently given as directly behind the sternum or on the left side, especially over the heart. In a few the pain commenced behind the sternum and then gradually spread through the course of months or years until it extended over the left side up towards and even into the neck, and occasionally on down the left arm. The pain is spoken of as "spreading" in the following sense. In the majority the pain commenced behind the sternum; in some, new areas were gradually included but the pain persisted at the original site, and further; once pain appeared in a fresh field it also became permanent, whether continuous or periodic in character. In all cases pain has persisted from the onset up to the time when patient was last seen, or to the time of death, with one exception. Under treatment many have improved and pain has been less severe or less frequent, but only one man stated that his pain had absolutely disappeared. This was a case with a large syphilitic aneurysm that for a year and a half caused severe and harassing pain. During the last two months of the patient's life there was absolute freedom from pain. In 66.6 per cent the pain varied with posture. In many the pain was relieved on lying down, and one patient is now confined to bed because the assumption of the erect posture with its accompanying increase in blood pressure promptly excited severe pain. Another man cannot sit in a chair for more than half an hour, and still another will obtain relief during a spasm by throwing his head well back. The majority of the men could not lie on the back or on the left side. In 18.7 per cent the pain was accompanied by *tenderness on pressure over the sternum or precordia* and frequently this tenderness persisted in the intervals. In two cases a zone of hyperalgesia extended in the shape of a wide band around the left chest. *A sense of pressure in, or constriction around the chest* was present in 53.1 per cent. Pain in the right arm did not occur but it was complained of in the left by seven patients. *Dysphonia* occurred once as did also *dysphagia*, but in that case there was an associated carcinoma of the oesophagus. *Headaches* were usually frontal, in one instance definitely occipital and they occurred in 48.4 per cent. *Disturbed sleep* was complained of in 71.7 per cent due to pain, sense of suffocation or paroxysmal dyspnoea, but most frequently to disturbing dreams and night starts. *Dyspnoea* occurred in 80.5 per cent and was second only to pain and dizziness in the constancy with which it was encountered. It was usually brought on by exertion and while frequently it accompanied pain such was not always the case; occasionally it was paroxysmal in character and then came on suddenly at night awakening the patient, and not preceded by pain. The mechanism of this dyspnoea is obscure. In only one or two could gross pressure be considered as a factor. In the cases where the heart was involved, reduction of cardiac reserve was probably partially responsible but in some of the cases in which there was no clinical evidence of valvular or myocardial involvement, breathlessness was an early and prominent symptom.

Cough was present in 52.3 per cent but there was no example of the "brassy" cough associated with aneurysm and in the majority there was a history of recurrent bronchitis, while four gave evidence of tuberculosis. There had been *hemoptysis* in 21.2 per cent, and one man non-tubercular, was invalided home to Canada on that account. *Dizziness* was complained of in 85.7 per cent, and definite *fainting* had occurred in 32.2 per cent. Symptoms referable to the gastro intestinal tract were given in 25 per cent of the cases. The given average duration of the symptoms was 3.98 years but this figure is of doubtful value. All the men attribute their present disability to hardships encountered overseas, and while it is undoubtedly true that in many the strain of active service initiated symptoms, yet in others it resulted only in an exaggeration of the same.

SIGNS:—The signs due to the presence of large aneurysms and to the result of pressure were but very infrequently met with, There was no visible or palpable *tumor* in the series nor was *unequal sweating* seen. A *bruit* and a *diastolic shock* were each encountered but once. *Involvement of the left recurrent laryngeal nerve* was definitely present in one patient and doubtful in another. A palpable *tracheal tug* was encountered six times but only once was it visible. *Vertebral dullness* was found in ten cases but four of these men were also suffering from pulmonary tuberculosis. *Inequality of pupils* was noted twice. In 25.8 per cent there was a palpable *inequality of the radial pulses* and in 66.6 per cent there was a difference in the systolic blood pressure in the two radials. As minor degrees of difference also occur in patients who are not suffering from chronic aortitis not much weight can be attached to this observation taken by itself. In 17.1 per cent there was present a palpable *thrill* and in 70 per cent the *pulsation of the subclavians* was palpable but in only a few was it visible. *Substernal dullness* was present in 74.7 per cent of the cases. It was usually most marked over the upper third and extended to right or left, particularly the right, in an upwards and outward direction, towards the clavicle. An *aortic systolic murmur* was heard in 60 per cent. The murmur was usually soft, often difficult to find, and best heard after exercise with the patient holding his breath in expiration and bending the body well forward. An *accentuated aortic second sound* was encountered in 51.5 per cent but in only a few had the sound that quality that would fit in with Potain's comparison to that of the tap of an Algerian drum—the so-called "bruit de tabourka." *Woley*, (20) gives the average normal systolic blood pressure in a man between 40 and 50 years of age as 130 m.m. Hg. with a minimum of 113 and a maximum of 146. The average systolic blood pressure in the 36 cases as taken in the brachial giving the highest reading and as taken at the highest point at which any of the beats came through was 148.4 m.m. Hg. and the average age 48.5 years. Examination of the blood was undertaken in a few cases only. In 5 some anaemia was found and in two syphilitics it was marked. In one the red blood cells dropping to 1,300,000 with 30 per cent Hb.; in the other the red cells numbered 2,300,000 and Hb. 35 per cent. The treatment of the syphilis with arsenic and mercury and the hypodermic injections of iron and sodium cacodylate did not influence this anaemia in the slightest. One man was given a blood transfusion and after showing improvement for three months the count rapidly fell to its former low level.

In a survey of these signs as detailed above it is considered that in the clinical diagnosis of chronic aortitis, particularly of the ascending portion, there are three that are of great importance. If there is present sub-sternal dullness, an aortic systolic murmur and an accentuated aortic 2nd sound, and, further if there is an absence of arterial hypertension, exophthalmic goitre, or undue mental excitement on the part of the patient then the examiner can be reasonably sure of his ground.

DIFFERENTIAL DIAGNOSIS:—The diagnosis of dilatation or aneurysm is sometimes beset with difficulties because of their latency, the presence of concurrent diseases, or because the symptoms, referring entirely and blatently to another system, may halt an examination which had it been completed, would have revealed the correct origin.

In the presence of cough, pain in the chest, dyspnoea and indefinite lung findings, tuberculosis, chronic bronchitis or emphysema are frequently suspected, and this is especially true in cases where the dilatation is of such a dimension or position that it interferes with the air entry in any portion of one or both lungs. It is interesting to note in this connection that *Garbowski*, (21) collected eight cases of gangrene of the lung secondary to aortic aneurysm. In analysis he found that the aneurysms were usually latent, usually of long standing, and their presence masked by the lung condition was usually determined only at autopsy. Symptoms of gastro-intestinal disturbances or gall-bladder disease are often present and they are not infrequently the first complained of by the patient. In the literature are to be found the records of abdomens opened in the presence of aortic aneurysms in a search for gall-stones which did not exist and the following are examples from the present series.

T.A.S. was suffering from an intestinal stasis with chronic constipation which dates back many years. There were also present some gastric disturbances, a considerable dilatation of the aorta and a generalized arterio-sclerosis with B.P, Systolic 160. Diastolic 108. About Christmas 1915 the man commenced to have nausea, anorexia, vomiting, and pain in the stomach. Rest in hospital and purgatives benefitted and he was discharged as a case of "iliac stasis." In February 1916, his appendix was removed and the operator noted that examination of the other abdominal organs revealed nothing abnormal. However, in September 1918, another surgeon drained the gall-bladder and later candidly recorded that there was no definite improvement.

J. S., while overseas, had symptoms referrable to the gall-bladder and on return to Canada was transferred to the S. C. R. and referred to the surgical side for treatment as a case of gall-stone colic. In this instance the surgeon withheld his knife and the symptoms have now migrated above the diaphragm where there is an aorta measuring 13½ cms. in the transverse diameter.

The pain in these cases is frequently confused with that due to neuritis, chronic rheumatism, or intercostal neuralgia, and several of the patients under review have received treatment for varying periods for one or the other of these conditions. One man following a diagnosis of neuritis, left arm and shoulder, had hydrotherapeutic treatment for several months, and a year and a half later the wall of his aneurysm gave way. The character of these pains is of great importance in diagnosis and the French clinician *Huchard*, (22) has the following to say with regard to them. "When one is dealing with symptoms of pain characterized by their persistence, their long duration, their intensity, when they remain unexplained, when they resist all ordinary medication, finally when they present certain special characteristics such as fixed location or diminished severity in certain attitudes of the patient, then we are not dealing with true neuralgia as is too frequently assumed. In such cases one should consider aneurysm as the probable diagnosis and if no tumor is perceptible as yet one should turn to the X-Ray in order to obtain certain proof."

Now and again one is confronted with an association of conditions such as the following: *S. L. H.*, seen in the office, stated that ten days previously while walking in the woods he had stumbled and fallen across a log on his right side. This was followed by a severe pain in the chest which had persisted and a shortness of breath of many years standing had become greatly exaggerated. On examination there was a right sided pleural effusion and slight fever and the question of traumatic pleurisy was raised. The man was sent into hospital and on further examination was found to have pulmonary tuberculosis. The X-Ray showed a bilateral involvement that was extensive and a dilated aorta that measured 9 cms. in the transverse diameter. No attention was paid to this in the light of the lung findings. Under rest in bed all pain disappeared and temperature came down, and the man was transferred to Tranquille Sanatorium. He spent several months there and then returned to the city and resumed work as a lawyer, only to drop dead suddenly one morning on the North Vancouver Ferry. A post-mortem showed rupture of an aortic aneurysm but unfortunately its aetiology was not determined. *Dieulafoy*, (9) remarks on the frequent association of these two conditions and states that in 46 cases of an aneurysm he found tuberculosis 18 times. Although several hundred tubercular patients were examined for the D.S.C.R. only in four cases was there found aortic dilatation. As has been already noted the association of cardiac disease with aortitis is a frequent one. In most cases the two lesions are part and parcel expressions of the same morbid process, and must be considered as such.

TREATMENT

What can be done for these cases? The first essential is an early recognition of the condition followed by an earnest search for the cause. The benefits that are to be expected from treatment are inversely proportional to the size of the aorta at the time treatment is first instituted.

(1) It is probably advisable that, on diagnosis every patient should have as the first step in treatment a period of rest in bed. *McLaughlin*, (23 in treatment of syphilitic aneurysms advocates three months in bed except for going to toilet. Anti-leutic treatment is given during this period but he states many cases will become symptomless on rest in bed alone. *McLaughlin*, found in practice, however, that six weeks was the average maximum period that patients would submit to total inactivity.

(2) Syphilis should be carefully sought for and if found the appropriate drugs should be at once exhibited.

(3) All possible foci of infection should be eliminated where possible.

(4) Diet is not of primary importance except in the syphilitics. Every patient receiving intravenous injections of one of the arsenic compounds should be on a diet that is largely Carbohydrates, and further, the diet should be instituted several days prior to the commencement of treatment and persisted in for a matter of weeks following the termination of the course. (29)

(5) In cases with an associated high blood pressure nitrogenous intake should be restricted and some will receive benefit from electricity in form of auto-condensation. Pain and headaches are often relieved and the general sense of well-being of the patient increased. Where blood pressure is reduced easily by this method care must be taken not to lower it too much. In one case with a blood pressure of 220 systolic a sudden intensive course accompanied by rest dropped the systolic pressure sixty points and the result was the man felt very weak, dizzy, and short of breath. Treatment was stopped and when blood pressure returned to 200, the patient felt quite well again and one or two treatments a week held the pressure at that level during the time the case was under observation.

(6) Sudden short severe muscular effort, constipation with its accompanying straining at stool and any other condition tending to raise the blood pressure—such as excesses of diet or alcohol should be avoided.

(7) No man possessing an enlarged aorta should engage in heavy manual labor, or be subjected to severe mental strain or worry. The steady progression of many of these cases is directly due to an increased blood pressure secondary to the strain of heavy mental or physical work acting on a diseased arterial wall. The plan of treatment adopted by the D.S.C.R. for Vancouver for cases due to or aggravated by service has been as follows:- (1) A period of rest in hospital with concurrent specific treatment where indicated, a search for, and elimination of all possible foci of infection and correction of metabolic disturbances where practicable. (2) On discharge from hospital the man is instructed in how to look after himself and where his pre-war occupation has been laborious he has been given Vocational Training in work where the physical demands are light. (3) On completion of course a pension is alloted in accordance with the percentage of disability from which the man is suffering. (4) All cases are reviewed periodically by the Pension Board, and if necessary further rest or special treatment is given, and moreover, if the disability increases so does the pension. In the light of our present knowledge this appears to be as near the ideal of treatment as it is possible to get. One word more with reference to the treatment of syphilitics. *Allbutt*, (25) states that syphilized arteries are likely to recover if treatment is commenced early. *Floyd Boutwell* and *Leonard*, (26) claim that syphilitic dilatation of the aortic arch in well marked cases even up to those with a diameter of 3½ inches may be improved by prolonged intensive anti-leutic treatment, and *McLaughlin*, holds a like opinion. Syphilis of the Cardio-Vascular system

should be thoroughly but carefully treated, and the object in view should be the amelioration of the symptoms and not the reversal of the Wassermann Reaction. *Stokes,* (27) of the Mayo Foundation, in a study of 101 cases of late so-called "Wasserman Fast" syphilis, found that cardio-vascular syphilis was the principal type exhibiting a resistant Wassermann and he indicates the following lines, to be followed in inaugurating treatment. (1) Direct treatment towards symptoms. (2) Do not try to get a negative Wassermann in resistant cases for a great multiplicity of lesions in various organs is usually present. (3) Weigh the degree of activity of the process and the extent of the damage done to, and the recuperative power of the most vital structure involved. (4) Identify the weakest elements in the patient's make-up and estimate the tolerance for arsenic and mercury, of the structures which bear the brunt of the treatment by effects—the liver, kidneys and spleen.

Prognosis depends on several factors. *Early Diagnosis* requires further emphasis in this regard and the *aetiology* is of importance, syphilis is of evil omen, while non-specific atheroma may run a long slow course. The *size of the aorta* and the *site of the dilatation or aneurysm* must be noted. *Complications* such as aortic regurgitation or involvement of the coronaries usually shorten greatly the lives of these cases, and, finally the *circumstances in life and the mental make-up of the patient* must be taken into consideration.

In these ex-soldiers, it is reasonable to believe that prognosis is on the whole more favorable than in a similar group drawn from an average civilian population whose unsheltered struggle for existence prevents the application of many of the therapeutic measures essential to an alleviation of the suffering or a temporary retardation of the process. Vascular degeneration once established is incurable, and if men and women live long enough it will invariably occur in every case. The ideal, therefore, is prevention for as long a period as possible. Too often, however, the physician is first consulted when the disease is well established. Early diagnosis is then essential and on it very largely depends prognosis. If possible diagnose a chronic aortitis before dilatation has occurred, diagnose a dilatation in its earliest stages, and do not miss either a dilatation or an aneurysm of symptoms without signs, because of neglect of the use of the X-Ray.

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THE PATHOLOGY AND TREATMENT OF CHRONIC CATARRHAL DEAFNESS*

Perry G. Goldsmith, C.B.E., M.D., C.M.

Associate Professor Otolaryngology,

University of Toronto

"THE unsatisfactory results of our treatment of the chronically deaf at the present time is little better than it was 3,400 years ago in Egypt, where on an ancient papyrus is written "medicine for the hard of hearing," or, in more recent times at the first successful aural clinic in the world the Royal Ear Hospital, Dean Street, Soho, founded in 1816. In Wylde and Toynbee's times 1840-1860, a favourable saying of more than one famous surgeon was, that "ear diseases may be divided into two classes, those that can be cured by the general practitioner, and those which being incurable may be regulated to the tender mercies of the Ear Specialist." Professor Partridge of Kings College in his sarcastic manner speaking to his students on Specialists said, "Ah, Gentlemen, a little wax is a godsend to an aurist."

A paper dealing with the pathology and treatment of chronic catarrhal deafness, treats of one of the most common of all aural complaints. I feel sure there is a great deal of unnecessary treatment being carried out and this is due in a large measure to a lack of conception or appreciation of the pathological changes underlying the various stages of this non-suppurative inflammation of the middle ear tract. To this must also be added the rather loose diagnostic investigation so often undertaken. I propose dealing with the changes that take place in the mucosa of the middle ear tract, its ligaments and ossicular chain, and also, to draw your attention to some features of central alteration, a pyschic rather than pathological change. It is only by a proper understanding of these features that anything like a rational therapy can be developed. It is difficult to state when an acute process may be said to become chronic, but if we accept the statement that chronicity occurs after all macroscopical evidence of inflammation has disappeared, one may place some limit, however imperfect, on the disease. There are I know many cases, often the most difficult, in which the disease appears to have developed insidiously and with so little inflammatory reaction of the tympanic mucosa as to be unnoticed.

The antecedent changes begin in all cases in an alteration in the mucosa and submucosa of the naso-pharynx and Eustachian tube. Nasal obstruction *per se* does not produce deafness. We all see many cases of nasal obstruction of long standing in which there is no loss of audition. Nasal obstruction from naso-pharyngeal conditions is a very different matter, for we have here not only the mechanical occlusion of the tube but the associated tubal inflammation with the change in the mucosa of the naso-pharynx.

While we admit the original starting point of all catarrhal middle ear reactions has its origin in a similar change in the nasal or naso pharyngeal mucosa, we must remember that the special reaction which has involved the tympanic mucosa is from its very position not so favourably placed as to be either amenable to nature's curative process, or available to the various topical measures so readily applied to the nasal and naso-pharyngeal lining.

It may be helpful to recall to your mind some points in connection with the mucosa of the middle ear tract, this tract being the Eustachian tube, middle ear proper or tympanum, the antrum and mastoid cells if they are present. Besides lining the walls of the tract it forms folds around the ossicles, ligaments, and tendons in the middle ear and lines the inner aspect of the tympanic membrane. This mucous membrane consists of three layers:

(1) Epithelial, which is cylindrical, ciliated in the Eustachian tube and pavement in the rest of the tract.

(2) Subepithelial containing lymphatic vessels and nerves and, in the Eustachian tube, mucous glands.

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*Read before the Ontario Medical Association Niagara Falls, 1921.

(3) Fibrous which is more or less adherent to the underlying cartilage and bone (Cheatle, *Encyclopædia Medici.*)

This membrane responds to irritation as does any other mucous membrane, and its pathological process is only modified when the products of inflammation have not free exit and are uninfluenced by the external air. An inflammation of the naso-pharyngeal mucosa has a much better chance for rapid resolution than the same degree and type of inflammation in the tympanum with the associated tubal occlusion. In the former, free and unimpeded removal of the products of inflammatory reaction contrasts strongly with the slow drainage and absorption in the latter. As the chronic catarrhal or adhesive type of changes in the tympanic mucosa is so frequently associated with the various stages of acute nasopharyngeal and tubal catarrh one may convey a more comprehensive idea of the underlying pathology by briefly following the microscopical changes in inflammatory conditions in the middle ear cleft.

Here the effect of acute infection is first, redness, swelling due to the engorgement of vessels and exudation of small cells in the sub-epithelial layer. Proliferation of the surface epithelium and exudation from the free surface of the mucosa which may be serous, or sero-mucoid, owing to the mildness of the irritation or in other words, low virulence of the infection, or to a heightened resistance of the host with a wide Eustachian tube, the inflammation may rapidly subside and resolution take place. The subepithelial exudation is carried off by the lymphatics, the surface exudate draining away, and the vessels return to their normal size.

A history of repeated attacks of this type of inflammation is very common in those who in after years become dull of hearing due to the changes in the mucosa interfering with the conductivity of the air waves. Each attack leaves the mucosa for a long time so sensitive to harmful influence that a slight cold or coryza suffices to produce a return of the inflammation. Politzer says that these attacks are peculiar and that every relapse exceeds the former in duration and often leads to permanent and incurable changes.

If from any cause resolution does not occur and the exudation has been plastic in nature, we frequently find the tympanum containing a mass of gelatinous material which takes months to years to absorb, if it ever completely does so. The usual change however, is continued engorgement of the vessels, persistence of the exudation with the formation of fibrous tissue in the subepithelial layer. The surface epithelium is lost and the lining membrane becomes converted into fibrous tissue which covers over the labyrinthine windows and invades the ligaments and covering of the ossicular chain. In this process adventitious bands form in the tympanum binding the ossicles so as to seriously interfere with their motion, and not infrequently the retracted membrane remains so from contraction of these bands of fibrous tissue, or from actual adhesion of the membrane to the promontory. We must remember however, that the normal middle ear is sometimes traversed by bands of striae which are the residue of the foetal mucosa membrane cushion.

There are many cases in which the formation of connective tissue and exudation co-exist. The mucous membrane is evenly tumefied and its surface uneven glandular or nodular. The depressions of the tympanic cavity, especially the recess of the fenestra rotunda and the attic are filled with succulent connective tissue.

When the secretion has totally ceased and complete transformation of the newly formed tissue into fibrous connective tissue has taken place, we then find the mucous membrane smooth thick, dull in color and firmly united to the underlying structures. It is curious that in some cases presenting very defective hearing, there is formed, not a diffusely thickened mucosa, but a deposit of fibrous connective tissue confined to the region of the fenestra, more particularly the round one. It is interesting to recall just here the hypothesis which ascribes otosclerosis as beginning from a middle ear inflammation whenever the greatest activity of the inflammation was in the region of the oval window. Frazer of Edinburgh has definitely identified middle ear changes in this region in very early cases of Otosclerosis. The change taking place in the mucosa of the Eustachian tube are quite similar to those in the tympanum and it is the shrinking of the newly formed submucous connective tissue that leads to narrowing or strictures. The changes found in the drumhead are opacities and retraction. The former vary greatly in number and situation. They may be scattered over the membrane the intervening portions showing darker, or the entire membrane may be like frosted glass. The retraction if long standing is usually permanent but in these cases the posterior inferior quadrant is generally found unduly movable. Fixation of the ossicles may be noticed if the short process s carefully observed at the edge of a Seigle's speculum. It is important to be able to determine if the drum-head and ossicles have lost their conducting power. This we are able to determine by reference to the experiment of Cheatle (*Jour. Laryngology and Otology, 1899*). He recommended stroking the membrane very gently with a fine probe or camel's hair brush. If this function is abolished the patient will feel but not hear it, or the noise produced within be very much less than it should be. This might be useful in considering the condition of the other ear when a fibrotic change has already taken place in one. With this understanding of the pathological process which results in the condition called chronic catarrhal or adhesive deafness, it is obvious that successful treatment presents little or no hope. As the underlying change is a fibrotic one and not a secreting change in its late stages, middle ear fibrosis would be a more descriptive term.

Fortunately the decrease in hearing is seldom uniform. The deafness may remain stationary or even slightly improve. The tendency however, is for a gradual increase in the deafness and in the later stages there is frequently associated a nerve lesion which in the end may dominate the picture. When the disease is confined to one ear, the other ultimately becomes involved. A deposit of fibrous tissue in the tympanum is also found in that form of suppurative middle ear inflammation that has existed long enough to be of the chronic type and when bony caries has not taken place with the ultimate pathological change in the mucosa. This is but little different from that found in the chronic catarrhal type, but the following difference may be noted in the type known as "otitis media purulenta residua;" the scar formation is greatest in the attic and around the ossicles and its subsequent contraction often produces great distortion. A perforated drumhead is common or flacid scars may be found. The important clinical difference is that in the suppurative type the deafness is not progressive and the changes in the membrane are largely confined to its inner or tympanic layer.

TREATMENT

(1) Preventative:—I believe that failure to assure ourselves that complete resolution has taken place in the tympanic cavity following acute catarrh of this portion of the auditory tract is responsible for the deafness which ultimately ensues. Sir Wm. Milligan puts it this way. (*Proc. Royal Soc. Med.*), "The neglected exudative catarrh of early life is, *facile princeps*, the main cause of chronic adhesive changes in after life." He believes the indications to incise the membrane and drain the middle ear, (as was the practice of Hilton many years ago), is almost as necessary in exudative as in suppurative catarrh, the difference being that in the latter it is imperative while in the former it is a matter of individual opinion.

Sir William Milligan says, "If we rely upon inflation we merely scatter the exudate for the time being we blow it towards the posterior end of the middle-ear cleft into the tympanic antrum Sooner or later it trickles down into the hypotympanum there to remain, there to act as an irritant responsible for the ultimate formation of that "ostial buttress" which is the dominant factor in the production of those pathological changes which ultimately induce distortion and disintegration of the middle ear. Follow the trend of pathological events and see what happens. Interference with the normal ventilation of the middle ear, either from the presence of a small amount of viscid exudate in the hypo-tympanum or from the presence of a definite although small amount of organized connective tissue around the tympanic orifice of the tube, is I believe the cause of the ultimate leucocytic activity in the subepithelial layers of the mucoperiosteum."

It is important then in cases of tubal and tympanic serous catarrh associated with such conditions in the naso-pharynx as adenoids, to make sure that you follow the after history of the patient with a careful record of the hearing so as to continue the tympanic treatment until all exudation has been removed. We are all too prone to let well enough alone in those cases of deafness in children which have been rapidly and materially benefited by the removal of adenoids

Structural defects in the nose leading to a chronic naso-pharyngeal inflammation should be corrected in those cases subjected to recurring attacks of middle ear catarrh. The hyperplasia of the tubal orifice may be relieved by the use of various pigments either applied with a post nasal applicator or better by direct vision. Living in a suitable climate with careful regulation of patient's habits, exercise, secretions will themselves materially aid us in overcoming the tendency to catarrhal inflammation.

I have so far briefly touched upon some of the measures which may be found helpful in preventing the early stages of the middle ear inflammation. I do not intend entering upon a discussion of the treatment of the various stages of catarrh of the middle ear. I will only direct your attention to that form in which *fibrosis* of the tympanic mucosa has occurred. The object of the treatment is to produce an absorption of this fibrous connective tissue and until we definitely influence this deposit our treatment amounts to little. Are we able to do this? I think not and it is the history of Otology for the past thirty years, that no method of intra-tympanic treatment or manipulation has materially benefited the patient's condition.

Take Gruber's text-book published in 1890, and the more recent one by Dan. MacKenzie of 1921, and you will find in the former under the head "otitis media plastica or hyperplastica," to-day's conception of the pathology of this disease and all the methods of treatment since advocated, yet, after a period of thirty years we find in MacKenzie's book this statement—"There is no known method of curing established deafness that is due to fibroid changes in the middle ear." In Gruber's book too you will find reference to the direct injection of fluid through the intact membrane in order to produce absorption of the fibrotic deposit in the tympanic mucosa. How closely does this correspond to Milligan's present day advocacy of opening the membrane in order to treat the mucosa directly. Again we find Urban Pritchard in his Presidential address to the sixth International Otological Congress held in London, 1899, referring to the treatment of this disease during the previous thirty years, speak only of advancement made in preventive measures in connection with associated nose and throat affections, and not at all to any real curative therapeutics. Let no one speak but with respect of aurists of bye-gone days, the reading of whose sayings of years ago should give the grace of humility to the many precocious "phenom"—ever ready to enlighten the Otological World. Such men have been referred to as "those who recklessly, under full sail, plough through a fog bank in therapeutics, tooting their horns."

One must not too readily say there is no local treatment likely to be of any benefit since we are not always able to determine in recent cases that some absorption of the middle ear thickening will not take place. How are we to proceed? Local treatment to the tympanic mucosa by means of air douche, may be productive of benefit and it should be tried. I do not mean by this a long course of inflation until the patient is disheartened. First we should record very carefully the audition powers for all tones and then after inflation repeat the records. The hearing may be worse. Let inflation then stop for all time. Many cases are to-day being inflated and retrogression of hearing is continually taking place unknown to either the patient or the doctor. The latter, you cannot blame, the former at best you may pity. If on the contrary improvement occurs, make sure it is maintained. A temporary improvement lasting for 15 minutes is common but rapid return to the former condition is the usual result. Do not depend on what the patient thinks happens to his power of hearing. Definite measurements alone are of value. A short improvement, one lasting for a few moments, I think may be due to the stimulation of the nerve by the air douche when it strikes the cochlea, or influences the labyrinthine tension by displacing the membrane in the fenestra. These cases are very often made worse, distinctly so, by continuous inflation. When there is a definite and lasting benefit one is justified in repeating the inflation, say, two or three times a week for a few weeks, and, carefully recording the patient's auditory powers. It is in these cases that one may try the various intra-tympanic injections, or vapors such as, amonnia chlorid, acetic ether or turpentine. Injections of fluids containing soda bicarbonate, menthol in oil, potassium iodide or pilocarpine, can only be expected to affect the case when there is still some exudation that can be made more fluid and more readily absorbed, or, drained away either by the Eustachian Canal or lymphatics. We might expect the use of stimulating vapors would assist somewhat in lessening the intra-tympanic thickening but experience has shown that they are of little or no benefit and the same applies to the use of hot air medicated or otherwise.

On this point Sir Wm. Milligan aptly remarks that these injections frequently do a good deal of harm. "The obliteration or partial obliteration of the tympanic blood vessels, the result of fibrotic change going on in the sub-epithelial connective tissue seriously impedes the absorption of the injected fluid and we return to the stage where we have an unabsorbed fluid lying in the middle ear, an irritant and acting as a foreign body." With this hypothesis he advocates a wash through by means of a catheter and an incised membrane. This incision may be made preferably with a fine cautery point so that it may be permanent

Inflation has however another object viz.. stretching the adhesions and so increasing sound conductivity. Some think if they are oiled up a bit by medicated or perfumed oil, they will give more readily. In the early stage of the catarrhal process, there is in the method some virtue but in the late stages the adhesions are not influenced but the drumhead by continual stretching from the intra-tympanic air blast or an exhausting speculum produces a flacidity of the membrane very detrimental to its functions. I have found the use of collodium beneficial in such cases.

What is one to do, you may well ask, in cases of tubal occlusion of long duration. If the hearing has depreciated say 75% it will be of no value to restore the air in the tympanic cavity. Some benefit in those less seriously affected may take place by having a more patent tube. This benefit may be temporary it is true, or it may stay somewhat, possibly, the progress of the disease. The Eustachian bougie with massage *in situ* is an aid far too seldom employed. It should be passed under inspection with a pharyngoscope. In fact I am convinced we often think we inflate the tympanum through a narrow tube when actually we have not our catheter in the tubal orifice at all. Furthermore, I feel sure that Politizeration will often inflate the middle ear when we fail to do so with a catheter. Milligan's advocacy of a permanent opening in the drumhead will accomplish all a permeable tube can do in these old cases.

What then is there to offer in the way of treatment for these fibrotic middle ears? Little I fear of preven value, yet, experimental work is now being carried out in Manchester by which advantage is taken of the power of radium of transforming the hard dense mesoblastic tissue into soft and pliable embryonic type and with the fibrils arranged in lines parallel to the suer-skin and mucous membrane. Everything depends upon dosage, duration of exposure and effective filtration. If this succeeds in its purpose in the middle ear, otology will have made marvelous strides.

There is another aspect of treatment that must not be omitted, I refer to the operations on the nose for the purpose of curing or preventing the progress of disease. These do not and cannot influence the disease when once fibrosis has taken place. Only when a definite catarrhal condition is induced about the tubal orifice in the exudative stages of the disease can any nasal operation be justified. If there is not a definite improvement in inflation, I caution you that you may withhold your operative zeal in the nasal air way. But fashion and tradition will I suppose ensnare the credulous and unscrupulous rhinologists whose sum total of otological scientific knowledge is represented by the number and variety of his turbinal shears and septal resection outfit. Various operations have been devised having in view the intratympanic severing of adhesions but no benefit can be expected and their performance is to be depreciated, but with those otologists who are always eager to do something more for the patient, it will I fear yet be the happy hunting ground as it was with ossiculotomy in chronic middle ear suppuration.

Are there still those who deceive themselves and their patients by thinking that removal of the subepithelial or tonsil glands of the oropharynx, they will influence in the least the absorption of fibrous tissue in the outer labyrinthine wall and its interstices?—I fear there are and more's the pity.

The association of a nerve impairment in the earlier period of the fibrotic changes, offers some hope for benefit. It is generally largely influenced by a morbid state of the general health such as anæmia, syphilis, chronic nephritis and rheumatism. Toxic influences such as nicotine and that found with intestinal stasis also play their part. Appropriate drugs and measures directed to influence these conditions may be happily combined with nerve stimulants such as nux vomica, arsenic and phosophorus.

If we are not able to influence the course of the disease by aural medications, we may lessen some of its distressing features and of these tinnitus is by far the most urgent. Its early appearance is of bad omen, and sometimes it so largely dominates the clinical picture that relief from *it* is more sought by the patients than the improvement in hearing. The use of acid Hydrobromic (dil) mm. XXV, with very small doses of quinine as advocated by Sir James Dundas Grant, has given me the best results. It is curious that quinine in large doses is destructive in its action towards the vestibular nerve endings, while in doses of $\frac{1}{4}$ and $\frac{1}{2}$ grains, it appears to have selective sedative effect. A smart mastoid blister, a pilocarpine sweat or Turkish bath sometimes is very useful, and small doses of thyroid have been spoken of favorably. There remains unfortunately many cases for which no medicines are of any value, but which are less affected if assured that there is no brain disease present and in time the noises will assuredly become less

The use of electrical devices to produce a continuous note corresponding to that heard by the patient has had some vogue in France, but English aurists who have used it do not speak enthusiastically about the method. Lastly there remains, operative treatment of the eighth nerve, and even this may not suffice though audition has been destroyed.

Goldstein (Twenty-fifth anniversary number of the Laryngoscope), in a paper on "An acoustic method of training the deaf." classes deaf mutes with some residual hearing as semi-deaf. In this class could come those with grave loss of hearing from catarrhal deafness, with secondary nerve involvement, Itard's work is quoted in this connection; "Musical tones must of themselves serve as an agent to restimulate the defective action of the auditory nerve and awaken its functioning possibilities. Sound vibration is the most valuable stimulation for the ear and a re-wakening of the auditory sense cannot be accomplished without its application. We may employ musical apparatus producing intense tones; we may utilize the drum where the grade of deafness is more marked; we may apply the sonorous tones of a bell in intense or mild degree to stimulate the auditory nerve. In deaf mutes, where complete deafness does not exist, all tone accessories must be consistently and persistently applied." ("Traite des Maladies de l'Oreille").

We owe much to Itard of France, Toynbee of England and Urbantschitsch of Austria for the present intelligent and systematic training of the seriously deaf in institutions throughout the world.

So far I have endeavoured to point out some lines of treatment directed to the disease, and have largely left untreated the patient himself. It was found during the war that hysterical deafness was becoming increasingly frequent. This is considered by Hurst (*Lancet, Aug. 7th., 1920*) to arise from the fact that the initial concussion deafness made such an impression on the soldier that on coming to himself, his first thought was for his hearing and that he became actually deaf as a result of auto-suggestion. A similar situation may arise when cases of chronic catarrhal deafness are operated upon, they may be very gravely worse because of auto-suggestion.

Hearing, Hurst points out (Croonian Lectures, June, 1920) does not consist merely of the perception of impulses conveyed to the brain when the ear is stimulated by wave sounds. It is an active process and in order that sounds may be heard, the individual must listen. Inattention during a dull sermon results not only in an absence of perception of the words spoken but of total deafness to the sound of the preacher's voice. It is clear that impulses to the cortical centre of hearing must be actually interrupted by inattention. The most satisfactory hypothesis is that in the act of listening the resistance at the various synapses in the auditory path become diminished by some such process, as a throwing out of dentrites which bring those of contigous neurones into more intimate connection. In inattention the synapses are unswitched, the resistance being increased by retraction of the dentrites. When our chronic catarrhal patient has been told unfortunately of the hopelessness of his condition, he naturally says to himself, why try so hard, it is so fatiguing, and after a time he ceases to listen. Then does our patient rapidly become worse, and we have not only a pathological lesion in the middle ear, but also, an hysterical element added. A case of a British soldier is recorded who became deaf while he was the only Englishman in a German prison camp. He ceased to pay attention to what was said as he could understand nothing, and in time he ceased even to hear the unintelligible conversation of his companions. His hysterical deafness was rapidly cured by psychotherapy a year later at Sale Hayne Hospital, England.

From this it is obviously our duty to encourage our despondent patients who go about ceasing to listen, that they must endeavour to preserve their hearing by improving their listening ability. And while doing this they are to cultivate rather than avoid the art of lip reading. Most chronic deaf people have already acquired some ability to interpret words from watching the speaker's lips, but they are very reluctant to admit it. We should encourage this by every means and advocate strongly an early course of instruction in lip reading, so as to avoid the danger of *ceasing to listen.* Besides it will take the patient's attention away from himself, for in a lip reading class with a good teacher, he will lose that trerible sense of loneliness he has and will no doubt find others who are worse than he. Here the saying "misery likes company," and "things are never so bad but they might be worse." has a direct application.

The French found among their cases of concussion deafness, many men who if they did not make an effort to listen, rapidly became much deafer from a kind of auditory stupor accompanied by noises. It is no flight of imagination to think of many cases of chronic catarrhal deafness in which a stupid listless expression exists, (as Fraser found in otosclerosis) can be made much worse by the same sort of auditory stupor. Babinski has done away with hysteria, he defined its limits; it has become "Pithiatism" (BaBinski and Froment, Hystero-pithiatism troubles reflexes), (*Military Manuals*, University of London Press), that is to say the predisposition to exhibit certain morbid phenomena which can be created entirely by suggestion and completely cured by the same mechanism.

Gray aptly remarks that "The psychology of individuals who suffer from dullness of hearing is an interesting study, but one that is so seldom considered by the aural surgeons, that it is no wonder many of these patients fall into undesirable hands. Many of these cases are greatly benefited by some sort of treatment different from what they have had, simply because of the well recognized truth, that it is easy to persuade deaf people that they hear better as a result of any new treatment. Others again are benefited because knowingly or not their new adviser has so acted on their mental state that they have been able to throw off as it were the super-added functional element and improving their hearing at once rapidly re-establishes their listening ability. The psychic influence of a trusted physician upon such incurable cases is often the only thing that is able to give back to them their vital energy. In this manner you have done them much more good than if you try to deceive yourself and them as to their future by a series of attempts at treatment extended over a long time."

In a paper on psycho-therapy in early childhood, Dr. Dingwall Fordyce (*Proc. Royal Soc. Med.* Vol. XIII, No. 9, July 1910), says," Psychotherapists have developed a complicated science of the subject. They often hypnotize themselves by novel and strange terms and display a tendency to prefer a complicated and elaborate explanation of symptoms and method of treatment to the most obvious. But as every general practitioner has long known, psycho-therapy is one of the most valuable means of treatment he possesses, the silent power he has of developing by various means the patient's cheerfulness, hopefulness, pluck and faith."

Before however, referring our cases either to the neurologist, or to the teacher of lip reading, if we do so, it will add greatly to their efforts if we ourselves explain to the patient how some of the deafness may be benefited. It is by explanation, persuasion and re-education, the essence of psycho-therapy, that we hope for benefit. The patient is made to understand how he has become originally deaf, and how this has been increased considerably without any change in the bone or ear simply because he ceased at sometime to listen attentively, which caused an increase of his deafness to such an extent that sounds he has forgotten as it were how to listen for them. He is next persuaded to listen intently and is taught that listening is just as active a process as moving, and requires a conscious effort on his part until it becomes automatic once more. Re-education may finally be required in order that the sounds the patient hears but at first cannot interpret, can be understood, but it will rarely be necessary or required except in hysterical deafness of very long standing.

Could anything be more striking than that case of a young man cited by Hurst (*Lancet, Aug. 7th., 1920.*) who was deaf mute from infancy and considered by many aurists as incurable. He has absolute loss of air and bone condution, and of auditory motor reflex, persistence of deafness during sleep, the characteristic speech of the deaf mute, and great ability as a lip reader. The vestibular reactions were normal and acting upon this alone, Hurst was able to prove the functional nature of the condition by restoring his powers of hearing by means of psychotherapy. The explanation given was that the deafness which developed when he was about three months old, must have been due to some organic but evanesent lesion. It occurred at a period when he was just learning to listen, and consequently interrupted his development in this direction. When the organic cause disappeared, he had become unaccustomed to listen and he never learned to do so again.

Gentlemen, I fear I have given you little to compensate you for your patience and considerate hearing, if my therapeutics is marked by paucity and largely of an advocacy of psycho-therapy, it is so because there is not much else in most cases to offer, but its efficiency is not to be gainsaid. It does not and obviously cannot reach the underlying changes but it can and does attain a measure of help to many distressing cases.

NOTES ON THE NEWER PATHOLOGY OF SYPHILIS*

J. J. Mackenzie, M.B.

Professor of Pathology, University of Toronto

A CONTRIBUTION to the pathology of syphilis in such a discussion as the one which we have this evening requires only the briefest consideration as it would be tedious to reiterate the facts which are known to all of you.

It will be only necessary for me therefore to touch on some of the newer aspects of the pathology of the disease as indicated by the study of it since the discovery of the treponema by Schaudinn and the introduction of the Wassermann reaction.

Before considering these, however, it is necessary for me to emphasize the fact, already well recognized, but which recent study of the pathology of syphilis has brought out still more strongly, viz., that syphilis is an infectious disease of most protean type the bearing of which concerns, more than any branch of medicine, that of the internist. The pathology of syphilis reveals that to consider it as a specialty, syphilology, or branch of dermatology, or a department of surgery, is to view it in a false perspective.

A critical study of the histological changes in syphilis emphasizes the unitary character of the lesions from the primary sore to the secondary, tertiary or even quaternary lesions.

In fact, the histological study, as I think clinicians will admit the clinical study, forces us to confess that the old classification into primary, secondary and tertiary lesions is wrong and should be abandoned. It has been abundantly proved that there is no syphilitic lesion without the presence of the treponema whether we consider the primary sore, the mucous patch, the periostea gumma or the brain of the general paralytic. It is true that the number of organisms present in these lesions vary, being more numerous and more easily demonstrated in the earlier than in the later lesions. But careful search in the latest lesions of the disease has always demonstrated them. And the collection of data in regard to the occurrence of positive Wassermann reactions in a general hospital population (in the Toronto General Hospital about 8%) indicates that widespread latent infection exists in the community.

The experimental and histological study of syphilis has demonstrated also that it promptly invades the body generally and that by the time the primary sore has developed the organisms have already invaded the lymph and blood stream and have produced histological change in lymphatics and blood vessels draining the area of the primary infection. Neisser showed that the organisms leave the infection area very shortly after the inoculation. In experiments on monkeys, the inoculation site had to be excised within 12 hours to prevent generalization. This has quite recently been confirmed by Brown and Pearce's study of the infection in rabbits. Male rabbits, when inoculated into the testicle with material from a syphilitic sore, develop a characteristic lesion of that organ. These authors have shown that not only immediately following the development of the testicular lesion in animals does its blood contain the treponema, but that before the experimental testicular lesion develops, the blood contains the organism and removal of the infected testicle does not save the animal from the development of metastatic foci. The bearing of this prompt generalization in an animal so slightly susceptible as the rabbit compared with man is sufficient comment upon the uselessness therapeutically of cutting out the primary sore.

Even the central nervous system shows the invasion by the treponema at a much earlier date than we have been accustomed to suppose. The study of the spinal fluid in primary syphilitics by Fildes, Parnell and Maitland, at Haslar Naval Hospital during the war, showed pathological cell counts in as early as the fourth week and it is interesting to note that those cases with early involvement of the central nervous system were the ones most refractory to treatment and most liable to relapses.

The histological lesions of syphilis are characterized by foci of lymphocytes and plasma cells with fibroblastic proliferation and changes about and within the smaller vessels. In fact vascular changes of a proliferative and obliterative type are eminently characteristic of the disease and one might say that the chief character of the treponema is its angeiotropic tendency. This is especially prominent in the later stages of the disease when we have involvement of the heart, aorta and central nervous system.

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*Read before Section of Medicine, Academy of Medicine, 13 Queen's Park, Oct. 11, 1921.

An important recent contribution to the pathology of syphilis has been given by Warthin of Ann Arbor. This has resulted from exceedingly painstaking histological studies of routine autopsies in which attention has been paid to the heart, aorta, liver, pancreas, adrenals and testicles. These tissues were searched for areas of plasma cell and round cell infiltrates and when these were found, the areas were stained by a modified Levaditi method for the treponema. In a surprisingly large number of the microscopic foci the organism was found either singly or in groups. In Warthin's Harvey Lecture he concludes that "the gumma is not the essential typical lesion of old or latent syphilis. It is a relativley rare formation: and the majority of cases of syphilis run their course without the formation of gummatous granulomata." A post-mortem experience in Toronto of over twenty years leads me to think that Warthin is right in regard to the comparative rarity of gummata in our autopsy material. MacCallum in referring to Warthin's conclusions notes that in autopsies on untreated syphilis in Chinese coolies in Singapore, he found typical gummata regularly and suggests that their comparative infrequency in the United States and Canada compared with the small lesions noted by Warthin was due either to the effects of treatment or to an inherited race immunity.

Warthin further concludes—"The new pathology of syphilis is based upon the demonstration that the essential tissue lesion of either late or latent syphilis is an irritative or inflammatory process, usually mild in degree, characterized by lymphocytic and plasma cell infiltrations in the stroma, particularly about the blood vessels and lymphatics, slight tissue proliferations, eventually fibrosis and atrophy or degeneration of the parenchyma."

"These mild inflammatory reactions are due to the localization in the tissues of relatively avirulent spirochaete."

"Syphilis tends to become a mild process: but at any time the partnership between the body and the spirochaete may become disturbed and tissue susceptibility or virulence of the spirochaete become increased so that the disease again appears above the clinical horizon."

Although Warthin has frequently demonstrated treponemata in these lesions in the heart, a critical reading of his papers suggests that he is too apt to conclude that any small focus of perivascular plasma cell infiltrate in the tissues is in itself pathognomonic of latent syphilis. It would be unsafe to contradict him without equally laborious and painstaking work, but one cannot help feeling that when he states that the incidence of syphilitic infection in this country is nearer 30% than 5-15% he is exaggerating and is basing his conclusions upon lesions which are not always syphilitic. A large percentage of Warthin's cases gave negative Wassermann reactions. The National Medical Research Committee's parallel investigation, where the Wassermann test before death was compared with the post-mortem diagnosis made independently, showed a remarkable agreement between the two series of cases and it seems evident that Warthin's cases with negative Wassermanns were those which could only be revealed by his laborious methods and which would escape the notice of an ordinary pathological examination.

A recent interesting question in the pathology of syphilis has been raised by Levaditi. In 1913 he claims to have obtained a positive infection of a rabbit from the blood of a general paralytic. This strain showed a much longer incubation period in the rabbit than the strain which he had obtained from a primary sore and gave rise to a much more superficial lesion.

As a result of these studies, Levaditi raises the question of variation in the character of the virus and believes that syphilitic meningitis, general paralysis and tabes is due to what he calls a neurotropic variety of the treponema.

This of course is not a new idea. Fournier and other clinicians, long before the discovery of the treponema, suggested that the virus in syphilitic nervous diseases was different. Their views were based upon the relatively slight development of secondary skin lesions in cases going on to G.P.I. or Tabes. Levaditi suggests that the treponema which produces nervous syphilis is of comparatively recent development in European races. He states that G.P.I. only began to be noted frequently at the end of the seventeenth century and did not occur during the syphilitic pandemic of the sixteenth century. He also points out that among tropical native races syphilis is much more malignant than among Europeans, and yet, nervous syphilis is rare. His suggestions are interesting and must receive consideration, but until his observation upon a blood infection in G.P.I. are confirmed they must be received with reserve. Especially is this so where rabbits are used as experiment animals since recently a spirochaetosis of rabbits has been discovered which is due to an organism very similar to the Treponema Pallidum and which produces skin lesions in the animals quite like those described by Levaditi as caused by his neurotropic virus.

The study of the newer pathology of syphilis has tended to broaden our conception of the disease and to focus our attention upon those minute focal areas which are characteristic of latent syphilis but which may have clinical importance if situated at important points such as the sinus nodal tissue or in the A.V. bundle or its end arborizations. At the same time the multiplication of these foci may lead to the interference of the function of important organs.

The relationship between the individual and the treponema in these latent conditions may be considered biologically almost as a state of symbiosis. The danger, however, is that under conditions which we do not understand the virulence of the organism may become accentuated and clinical symptoms may become manifest. It may be also that these variations in the activity in latent foci may account for the curious variability of the Wassermann reaction in treated or even untreated cases.

"SYMPTOMS OF RECOVERY"*

Ernest Moorhead. M. B. (Dublin) B. Ch.

Assistant Physician, Winnipeg General Hospital

I SUPPOSE it happens occasionally to most of you as it does to me, when sitting at leisure, to take stock; that is to look over the broad field of medicine, trying to decide what we hold that is of real value, and what there remains yet to be discovered. Frequently with me, it is in a spirit of pessimism, for there seems to be so much of human ailments that is still clouded in obscurity when compared with the facts that we know. If you say that such a spirit is unworthy, in view of all the discoveries that are being made from day to day, I would reply that there are very few real discoveries being made; what is being accomplished at the present time is to accumulate a large mass of symptoms or physical signs, and to note anomalies of chemical, bio-chemical or pathological interest; but the master spirit which will combine these into a comprehensive understanding of disease, is still wanting.

It is as if a landscape painter were to stand before his easel ready to begin his picture, here and there on his palette, he has placed various colours or combinations of colours, all of which are required to complete the picture; but he lacks the genius which will allow him to transfer them to the canvas in such a way that they will blend together, and enable the observer to see what the artist wished to depict, and how all the colours form an integral part of the finished picture. It is only at rare intervals in the century that there is developed the master mind with the ability to combine all these colours into one memorable picture, or to incorporate all these symptoms and scientific findings into one clear explanation of a disease. I would say in parenthesis that I do not for a moment wish to under-rate the wonderful advances of modern surgery, the successes of the laboratories, the benefits of the X-ray, etc. I refer rather to that large number of diseases which we meet with every day, about which if we are honest with ourselves, we must confess that we know little, even though they have been the subject of voluminous writings.

I speak to you thus, because I think I see the situation as it exists to-day. We secure the end products of disease, and send them to the pathologist. He tells us accurately and scientifically what he sees. We then ask him, "What caused this condition?" In other words we ask him to review the past and to create a series of events of which the pathological specimen is the end result. As well ask him to go and grope among the ruins of a house and tell us what caused the fire.

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*Delivered before the Winnipeg Medical Society.

The pathologist usually answers with a reasonable explanation, and that explanation is satisfactory, because of his imagination; and still more because of our ignorance. If he were wise, he would say to us, "I can give you real assistance, if you will let me see the next case of this type that you meet, one or five years before this stage is reached. "But," you will say, "I don't know the symptoms at such an early period." There is the answer, gentlemen. We do not deny that the symptoms are there, but we are unable to recognize them; it is quite possible that we have not even looked for them.

The people who perchance have these symptoms, have been our patients for many years. They have consulted us from time to time during that period. For what? For trivial complaints: what we set down as sluggish liver, a little gastric upset, febricula, a twinge of rheumatism, neuralgia, and all the other terms we use with the object of concealing from our patients and ourselves, the fact that we know little about their diseases.

If these passing ailments are, as I believe, the milestones which mark the progress of a chronic disease, you may make your minds perfectly clear on one point, neither the laboratory nor the hospital is going to help you in their elucidation. Do you suppose that these patients would submit to extensive blood and cerebrospinal examinations, to test meals, bismuth series, etc? Do you think that they would go into hospital frequently, for a thorough examination? They would not, unless you frighten them to an unjustifiable extent. Therefore, the pathologist and the hospital physician are never going to see them in the early stages, and if the general practitioner does not deduce the correct solution, nobody is ever going to do it. At the present moment, as regards these diseases, I think we are in a cul-de-sac. We cannot advance. We cannot even make a ladder out of the multiplication of signs and symptoms. I feel that the pathologist also has reached the limit of the assistance that he can give us. All that remains for us, is to cast back, and start off in a new direction.

To assist in making such a start, I am going to advance a hypothesis as follows:

Most of the symptoms which we call disease, are not the symptoms of the disease, but rather the symptoms of recovery. They are due to the attempts on the part of nature to cure the disease or to protect the organism, so that no further injury or increase in the disability may occur.

I am going to ask your indulgence for a short time, while I try to show you how this hypothesis works when applied to ailments with which we are familiar. I will make frequent use of *icatrix naturae*, the healing power of nature. the term nature, and by that I mean, *vis med-*

Let us discuss the end results of a burn or scald of the arm of moderate degree.

All that we see is skin into which has been incorporated an excessive quantity of fibrous tissue. But this fibrous tissue is not the disease. The burn or scald with its accompanying damage was the disease. You are looking at what nature has accomplished in the way of curing the injury; that is to say, you have before you, the symptoms of recovery. The scar tissue may not function as well as normal skin, and it constitutes a disability which is quite apparent to the owner; it is more sensitive to thermal changes, and to excessive use, but it is tougher and in some respects more resistant than normal skin.

Consider the ordinary case of long standing naso-pharyngeal catarrh, caused by an irritant either of a thermal or chemical nature. What is the function of the cells of the mucous membrane? To secrete; and the quantity and quality of the secretion depends on the stimulus. When these cells are irritated excessively, they justify their existence by carrying out that one function, but they secrete with a tremendously augmented energy, and successfully protect themselves by a thick layer of mucus, from further injury. This increased mucus for which the patient consults you, is not the disease; it is the symptom of nature's attempt to cure that disease; and you must remember that as in the case of the burn, even under the most favourable conditions of recovery, you are not going to have a return to a normal mucous membrane.

Let us review yet another disorder, hyperchlorhydria. When you constantly overload the stomach, or load it with a quantity of material that is hard to digest, some reaction is bound to follow. If the secretory cells of the stomach are healthy, they respond to this demand, by discharging the one duty for which they were created, that is, to secrete, but they do this with such vigor that more than enough for the requirements of digestion is supplied, and this excess is responsible for the discomfort which ensues to the individual. To those who say that a test meal frequently fails to show an excess of hydrochloric acid, I would answer that a test meal is neither stimulating nor appetising, and that it does not overload the stomach; and from the clinical aspect, I would point out that one is able to give relief by making use of a common sense diet coupled with small doses of belladonna to reduce the secretion.

Note that in this case the unsuitable food with the accompanying violence to the mucous membrane, was the disease.

Whatever symptoms this may have caused, they were not sufficient to compel the patient to seek your advice; or if he did consult you, you failed to recognize the symptoms. The condition could have been relieved by vomiting, or by hurrying the overload in to the intestine with a probable resultant enteritis, but the provocation was not severe enough for that. What took place was an increased outpouring of digestive juices in sufficient quantity to deal with the unsuitable food. In this way the stomach was enabled to continue to function, but with symptoms which showed that more serious disorder had been avoided or overcome.

I wish to carry the point further. What is the symptom of recovery of pleurisy? Pleural effusion. The process is similar to what we have already seen. The secreting cells of the pleura are stimulated to provide an excess of fluid. The inflamed surfaces are separated, thus allowing of rest and cure; but the effusion is certainly not the disease.

It frequently happens that some irritating substance is taken into the alimentary system. It is unreasonable to call the vomiting which ensues, disease. This vomiting is the very drastic method which nature takes to cure the disease, and is the symptom of recovery from the injury to the mucous membrane. That it is frequently carried to a greater extent than is necessary, is a question that I will deal with presently.

Similarly if unsuitable material has reached the intestine, the diarrhoea is nature's attempt at getting rid of such irritant. The patient frequently consults you at a time when the injurious element has entirely disappeared from his system; he consults you for symptoms which are not those of disease, but accompany the recovery.

If it appears to you that I have laboured the point and that I have spoken about self-evident truths, I would suggest that I have done so for the purpose of getting your thoughts to follow a certain trend. We do not take time to look for the explanation of each sign and symptom, with the result that many truths are not appreciated, and too often the attitude of the physician in approaching a patient, is to be summed up in the statement, "Whatever is, is wrong."

There is one point of similarity that you will have observed in all these cases, and I would ask you to note it carefully: Nature usually carries her process of cure to an excessive degree. Once she has started various cells to function abnormally, they continue to do so with remarkable persistence. Nature does not seem to know when to stop.

She is always prodigal in her efforts, as witness the million seeds for the production of one tree or one weed, or the millions of spermatozoa, in order that one alone may impregnate the ovum.

If then we have learned anything from all these examples, it is, that in the subacute or chronic diseases, nature has begun the process of cure before we recognize that disease exists, and that the pursuit of this one time beneficial process to an extreme degree is responsible for symptoms which in a loose way we call symptoms of disease, rather than symptoms of recovery.

Can we then formulate an analogy between these maladies which are more easily understood, and that large class of diseases of excessive or diminished glandular secretion, or those diseases which are accompanied by tissue changes, or again those of which if we are honest with ourselves we must confess that we have not yet grasped the meaning?

First let us consider that condition known as high arterial tension. When we first became competent to measure blood pressure, true to our creed that whatever is, is wrong, we went to considerable lengths to try to reduce it. Then it was suggested that perhaps it was there for a good purpose. We have since learned to appreciate the truth of this, and at the present time we find that a great many of our patients are able to carry on comfortably for years, with a blood pressure that would appear to be excessive. Now I hold, as I am sure you all do, that that high pressure has been engendered to overcome some condition. Yes, but what condition? There may be records but I have not seen them, where some vigilant doctor has followed such cases carefully, and, from a normal pressure in adult life, has noted step by step the gradual increase in tension, which finally results in a permanent pressure very much above the average. More commonly the abnormal pressure is revealed incidentally during the course of an examination. The idea I hold, is that disease existed before the pressure began to rise and that this was the only time when it was possible to discover the real character of that disease. What I ask you to accept is the probability that this increasing tension was the means by which the disease was cured. All that remains is the symptom of recovery carried in all likelihood to an unnecessary degree. Who then is going to find the disease? The general practitioner, aided by the pathologist. We cannot expect the pathologist to carry out countless tests on individuals who may never become sick. But an alert physician, careful and painstaking in his methods of examination, and tabulation, knowing when to call for the pathologist's aid in the early stages of certain well chosen cases, may solve some of the problems which are still shrouded in darkness.

How many of our patients die of conditions which are associated with fibrosis? In a large percentage of these the irritant is evident, such as alcohol or syphilis; but what about that immense number which remains. If, as I believe, a deposit of fibrous tissue is always nature's method of curing a damaged organ or vessel, then what was the disease? When did it begin? Why should the morbid condition have been conquered, leaving an individual to all intents and purposes healthy, but with hardened arteries or fibrosed structures? If it is a tissue change which accompanies old age, why should such a large percentage of the aged, escape it? As I am convinced that nature cures a burn by depositing a new skin containing an excessive amount of fibrous tissue, so I am convinced that she has cured a disease of which we are not yet aware by the formation of fibrous tissue in the arterial walls.

We have always held the belief that this fibrosis was achieved gradually, and was due to a long continued process of irritation by some toxin. Are we justified in that belief? We have seen that the fibrosis of the skin of the arm was the result of a disease which lasted only a few seconds. Have we any parallel in these obscure medical cases? Is it possible to contemplate an infection, short lived in its action, but productive of marked tissue changes? That I think it a question about which it would be idle to theorize; but there is one suggestion, I will make. All of us encounter cases of sickness with the following symptoms; sudden onset, intense headache, highly elevated temperature and pulse, marked prostration; and nothing else: I mean nothing which will enable us to classify them. All the symptoms have disappeared in two days. What is the nature of these disorders? I think that we are dealing with morbid conditions of very varied classification, some benign, some injurious, that is as regards the end results. It is however in an earlier period like this, and not when the arteries are of the pipe-stem variety that we are going to find that disease.

Diseases of the ductless glands are at present very much in the fore-ground in scientific circles, and we are still endeavouring to elucidate the different effects on health of hypo and hyper-secretion.

I do not propose to deal with these diseases in detail, but I will ask you to consider one of them, exophthalmic goitre, associated with hypersecretion by the thyroid gland. Will you agree with me when I assert that it is unlikely that a thyroid gland develops over activity out of a spirit of perversity?

Is it not more reasonable to suppose that the hypersecretion commenced in response to the necessity for relieving some morbid condition, and that nature carried the process along to a stage when the cure became worse than the disease? If you ask me what that disease might be, I must confess that I do not know; but in my turn I will ask you if you have ever looked for, ever thought of the possibility of such disease. It is going to be difficult to find, because when the symptoms of hyperthyroidism become apparent the disease has probably been overcome, or if not, its symptoms are overshadowed by the later conditions.

In conclusion I will deal with that most terrifying disease of all civilizations, malignant disease, a disease whose etiology is at present hidden in an impenetrable fog. Wherein does its malignancy lie? In the multiplication of cellular life carried to an extreme degree.

I stand open to correction when I state that this growth is harmful to a very limited degree. Under favourable conditions, you or I could be the host of a malignant growth, and live for many years, always provided that it did not interfere with the normal action of some vital organ. It is in this process of growth carried to excess that the malignancy lies. But what stimulated this growth?

I hope the pathologists will pardon me if I suggest that attention has been focussed too intensely on the cellular overgrowth, to the exclusion of the possibility of this growth being in the first case beneficial and stimulated by the necessity of overcoming some disease, whose symptoms are at present hidden from us.

To revert to an earlier statement; I think you will agree that pleural effusion is easily capable of killing the individual, if no relief is given, and yet pleural effusion is in the beginning beneficial. May it not be so with malignant disease?

You cannot criticize the pathologist. He does not see the deadly growth until it is an accomplished fact. As I remarked previously he may well say to us. "Show me one of these cases, a year, five years earlier, and then I may be of some real assistance to you."

You will say to me, "Of what use is all this? These words have added nothing to the sum total of human knowledge."

That is granted; but perhaps I may have suggested to some of you a direction in which your energies can be much better determined than in the multiplication of isolated symptoms of a disease which is already fully established. These notes were written for one purpose, and that is to express my belief that as regards disease, we have reached the limit of our enquiries along the present lines. If we are to justify our position in the world; if we are to continue to call ourselves a progressive body, we must be prepared to strike off in a different direction. We must travel the road as individuals knowing that guidance is not to be furnished by the hospital wards or the pathological laboratories, but that they stand ready to help us, and to smooth the road, when we have shown that a road is feasible.

THE TREATMENT OF SO-CALLED SCIATICA

J. A. Nutter, M.D.

Montreal

THE clinics of the Montreal General Hospital have been, of late, supplied with many patients complaining of leg-pain, more especially of pain in the distribution of the great sciatic nerve Added opportunity of studying the causes and treatment of this distressing affection, which has long been termed sciatica, has thus been afforded, and it is the hope of the writer that a further contribution to this subject may prove of interest, if not of benefit. It has on a previous occasion been shown that the conception of sciatica as a referred pain, rather than the result of disease or injury of the sciatic nerve itself, has been steadily gaining ground. Interference, mechanical, inflammatory, or otherwise with some neighboring articulation or organ connected by nerve fibres with the sciatic, may cause pain along the course of this nerve, even though the nerve fibres themselves remain quite intact and unaffected in any way by the disturbing force. Sir William Gowers, about thirty years ago, insisted that practically every case of sciatica was of the nature of a true neuritis. The influence of his teaching has been so strong and so enduring that a departure from his dogma has been slow in coming. It is, however, now asserted by neurologists that tenderness in a nerve, along whose tract pain is experienced, is not in itself sufficient evidence to diagnose neuritis. By neuritis is meant inflammation, whether by disease or injury, of the trunk of a nerve, from which it follows that such an inflamed nerve cannot be expected to function properly. A motor nerve the subject of neuritis should manifest at least demonstrable weakness, if not entire loss of power, in the muscles supplied by it. This is, perhaps, most characteristically shown by the loss of power in pharyngeal or cardiac muscle following diphtheria, and such conditions are manifestly true neuritis. Similarly sensory nerves the subject of neuritis should show perverted manifestations, sensation being either diminished or exaggerated. Reflexes should also be diminished or absent, trophic changes may occur, and last of all the reaction of degeneration should be present in the weakened or paralysed muscles. We may therefore say that one or more of these manifestations should be present before a diagnosis of true neuritis is justified. In a wide experience of sciatica such manifestations have been seldom found. We may therefore, perhaps, say that it is now very generally recognized that sciatica is in the great majority of cases a manifestation of referred pain, and that wherever the offending irritation acting as the source of pain may be, it has managed in some way to explode, as it were, by means of communicating fibres, along the course of a nerve not itself affected. The intimate relationship between the sacro-iliac joint and the roots of the great sciatic explains why disturbance in this joint is so frequently followed by pain down the corresponding sciatic. Emerging from the pelvis by the great sacro-sciatic foramen, where it is again exposed to irritation, the great nerve trunk proceeds down the back of the thigh and supplies the muscles at the back of the thigh and, by its branches, all the muscles and nearly all sensation below the knee, in both leg and foot. The several articulations of the lower limb receive filaments from it and its branches. In the lower abdomen and pelvis are the ramifications of various nerve trunks forming the lumbar and sacral plexuses, ramifications so extensive that by their means the great sciatic nerve is linked up directly or indirectly with every articulation and organ in the vicinity. Hence it is that the pains of lumbar arthritis, tuberculosis of the hip-joint, prostatic inflammation, sacro-iliac relaxation and rectal cancer all may, and at times do, overflow their proper channels, gain access to the great sciatic and express their superabundant irritation along its trunk in a wave of pain. Thus in one case sciatic pain may be the manifestation of vertebral disease, while in another it may be due to rectal cancer. It follows, therefore, that to call a diseased condition "sciatica" is not to make a diagnosis at all. It is as improper and unjustifiable to diagnose any pathological condition as "sciatica" as it would be to make a diagnosis of "headache." It is to be hoped, therefore, that such use of this word will henceforth be discarded by the medical profession.

While in the great majority of cases, probably eighty or ninety per cent, pain along the great sciatic is referred from some neighboring structure, most frequently from some irritated and painful joint, at times it may be due to direct pressure upon, and therefore injury to, the nerve trunk itself. The pregnant uterus, the use of forceps during labor, aneurism, varicose veins inside the sheath of the nerve, pelvic tumors and inflammatory masses, even a large stone in the bladder may cause direct pressure and hence neuritis, with its attendant pain. At the sacro-sciatic foramen a deposit of bone, generally of rheumatoid or luetic origin and connected with the lower portion of the sacro-iliac joint, may be a source of direct irritation. Back of the hip-joint, also, painful adhesions or even bony pressure may result from old arthritis or fracture. An enlarged popliteal bursa has been known to be a source of direct irritation, as well as the use of the leg-holder in gynecological operations. Lumbar ribs, abnormally elongated transverse processes and other congenital deformities, extreme scoliosis and spondylolisthesis may cause pressure pain. It must, however, be emphasized that such conditions are rarely seen in civil practice. In the orthopedic clinic of the Montreal General Hospital no cases of sciatica coming under the head of direct injury to the nerve have been seen during the past two years.. In one instance, that of an old gunshot wound of the hip-joint, direct pressure upon the nerve was at first suspected. Further examination, however, demonstrated that the pain was referred from the sacro-iliac joint of the same side, which joint was the seat of chronic strain the result of the combination of stiff hip and shortened leg. Thus in by far the greater number of cases the sciatic nerve is not the source but rather the medium for the expression of pain, pain which is the cry of some neighboring joint unable to express itself adequately through its own intrinsic nerves.

In by far the greater number of cases accompanied by sciatic pain. disease or injury is demonstrable in one or more of the joints of the spine or of the lower extremity. Considered as a pain, therefore, and not as a disease, sciatica is almost essentially of joint origin. Of these various sources the lumbar spine plays the most important role, the sacro-iliac next and the hip-joint third in the order of frequency. Other sources of referred pain seen occasionally are diseases of the uterus and its appendages, of the posterior urethra and the prostate, pelvic inflammation, stone in the kidney, pyriformis irritation due to flat foot, and inflammatory conditions of the lower abdomen such as appendicitis. If therefore we discuss the lumbar spine, the sacro-iliac joint and the hip in their relationship to sciatic pain, we shall have dealt with the causes of probably four out of every five cases..

Such joint conditions, speaking broadly, are either inflammatory or traumatic or, as frequently happens, a combination of both. Of these disturbances non-tuberculous disease of the lumbar spine including gouty arthritis is the greatest single offender, whether caused by infected tonsils, urethritis, dental abscesses, intestinal stasis, protein putrefaction, etc. Pott's disease is probably next in order of frequency, traumatic conditions to the spine following closely behind. Syphilitic arthritis, typhoid spine, in fact any disturbance to this region may be a source of sciatic pain. It is only fair to state that in some cases, as for instance an extreme scoliosis with its inevitable arthritis, it may be impossible to determine without a period of observation whether the pain is due to nerve pressure the result of the scoliosis, or is referred from the accompanying arthritis.

In the case of the sacro-iliac joint any factor constantly disturbing the body equilibrium will tend to cause in time a chronic strain or relaxation of this joint. A pronated foot will cause sacro-iliac strain, so also the weight of the pregnant uterus or of a pendulous abdomen. A short leg and a stiff hip will always result in unusual strain to both knee and sacro-iliac joints, with the possibility of painful disturbance in each. In the case of a strained knee the source of the pain will be obvious, while the sacro-iliac strain may proclaim its presence by way of the sciatic nerve rather than locally. Here, however, the presence of tenderness over the posterior superior spine will be found to serve as a guide to the source of the trouble. By suddenly stooping to the floor an intense pain may be caused in the lumbar region, at times accompanied by a snapping sensation. Although at the onset tenderness may be elicited in the lumbar muscles, it will often be found later to have shifted to the posterior superior spine, where its presence is indicative of sacro-iliac strain. Such a condition has often been diagnosed as rheumatic in origin. but to the writer its sudden onset following trauma and without previous disturbance speaks against this view. It would seem more rational to consider the pain as due to a definite trauma by which the sacro-iliac joint has suffered.

During the later months of pregnancy backache frequently exists. After labour such is often greatly increased, and may radiate down one or both legs. Such a condition is usually found to be associated with sacro-iliac relaxation, to which the patient is predisposed by the softening of the pelvic ligaments incident to pregnancy. In addition the weight of the pregnant uterus throws a great strain upon the junction of the spine and the pelvis, while the exaggerated lithotomy position assumed during labour is likely to still further strain the articulation. It is quite possible, too, though rarely seen, that direct pressure on the sciatic nerve may be caused by the foetal head in the pelvis or by the use of the forceps. In the experience of the writer, however, treatment directed to the support of the definitely relaxed sacro-iliac joints is usually successful, a result not to be expected were the case one of actual damage to the nerve.

As in the lumbar spine non-tuberculous arthritis of several years' standing should show lipping at the sides of the vertebral bodies in the X-ray picture, so in sacro-iliac arthritis of this nature one expects to find lipping at the lower margin of the joint, at times accompanied by spicules of bone which appear to be quite capable of irritating the sciatic trunk as it passes out of the pelvis by the great sciatic foramen.

The sacro-iliac joint may be the seat of tuberculous as well as suppurative arthritis, the former characterised by tenderness over the posterior spine, pain on pressing the iliac crests together, a tendency to cold abscess formation and evidence of bone destruction in the X-ray picture, the latter by a rapid course, high temperature, pain and abscess formation.

In the hip one deals with both injury and disease. Arthritis deformans or, to speak more broadly, non-tuberculous arthritis is the most frequent offender. Cured or rather arrested hip disease may be a cause of sciatic pain, either by itself or by the production of sacro-iliac strain. At times the pain simulates a return of the original disease, and may cause a great deal of unnecessary alarm. Hip traumatisms of all kinds are capable of causing sciatic pain, the most commonly seen in civil practice being old fracture. It is interesting to note that here, as in old hip-disease, the sciatic pain is often caused indirectly through the strained sacro-iliac joint, rather than directly from the injured hip joint itself.

True sciatic neuritis will not be discussed here at any length, whether produced systemically by various toxines or secondary to actual nerve pressure. True primary sciatic neuritis is rare, and when present follows the same course and yields to the same treatment as neuritis elsewhere. The writer wishes to emphasize the importance of an anaemic and exausted condition in prolonging and exaggerating sciatic neuralgia.

With regard to the time honored custom of putting the blame for sciatic pain on the so-called "rheumatic diathesis," the writer urges strongly that this vague, misleading and unscientific term should be utterly discarded. As Thomas McCrea has pointed out, it means nothing and is a cloak for ignorance. One patient's "rheumatic diathesis" in reality means chronic infection from diseased tonsils, and in another case abscessed teeth, disregarded and perhaps even unnoticed for years, are at fault. The use of the term is a confession of failure to reach the correct diagnosis. Ralph Pemberton of Philadelphia in the Archives of Internal Medicine, March 1920, insists that rheumatoid arthritis is accompanied usually by a lowered sugar tolerance.

TREATMENT

The important subject of treatment of sciatica can be made very short. It is the question of diagnosis that presents the greater difficulty, and when once the actual source of the pain is discovered the appropriate treatment is at once indicated. As joint disease of some sort is in most cases at fault, this must be appropriately treated. Mechanical disability should be overcome, as far as is possible, by apparatus or by operation. Do not forget that there may be ample X-ray and other evidence of old disease in the spine, sacro-iliac or hip, but bear in mind that this disease may have long since spent its force, leaving in its train deformity or joint disability. One can readily understand how, in a case like this, treatment directed toward the cure of a disease already cured will fail to relieve the sciatica, while the relief of deformity or mechanical disability resulting from the now quiescent disease may have the desired result. Thus in almost all cases treatment falls under two heads, medical and mechanical. The first feature remains the same whatever joint is involved, while the mechanical or operative element varies greatly according to the region under treatment.

In non-tuberculous arthritis, the most common source of sciatica, search should be made for an infective focus or foci, whether the spine, sacro-iliac or hip be concerned. Tonsils and sinuses should be examined by a laryngologist, while the teeth should be X-rayed and examined by an expert in dentistry, whose recommendations as to treatment may be sent with the patient to the family dentist. The gynecological and genito-urinary specialists should be consulted if the case history sound at all suspicious, while metabolic and Wassermann tests may reveal important information. Faulty bowel movement should be corrected, the intestinal tract examined roentgenologically, and when necessary special diets ordered. Such a course is particularly indicated when gout is suspected and the patient admits a fondness for, and an over-indulgence in, meat. In such cases a low protein diet excluding meats, fish, soups and gravies, should be tried for three or four weeks, supplemented by a quart of buttermilk daily. For local treatment baking combined with massage is a distinct aid in such cases. The writer is not aware of any relief that electricity can give that cannot be obtained by other physical agents such as baking and massage.

If sacro-iliac strain or relaxation act as a cause of sciatica, improvement is usually obtained at once or in a few hours by the use of a flannelette spica, made to bind the pelvis and hips very tightly together. This is more efficient than strapping the sacro-iliac joint, and much less troublesome to the wearer. If the spica is successful in relieving the pain one feels sure that the source of the irritation has been found, and the patient, if a woman, may have her corset adjusted to give greater sacro-iliac support. This consists in having the corset descend so low that the great trochanters are included in its embrace. The corset should lace in front and be solid in the back. It should be made to lace in two sections, the lower ten inches very tightly, the upper portion loosely in order to permit easy breathing. It it the lower section that is important. In addition extra steels should be inserted at the back of the corset, and a pad about four inches in diameter and about three-quarters of an inch thick should be attached to the inside of the corset in such a position as to press against the affected sacro-iliac joint. This pad will be found to give a feeling of grateful support. In a woman patient, too, the corset can be so stiffened and strengthened as to give the support necessary in lumbar arthritis. In male patients a sacro-iliac brace must be specially made and fitted. Such a brace will need perineal straps to hold it down, except in very obese patients. In the case of scoliosis a corrective jacket or jacket-spica will often be found to give relief, and may be followed, on the subsidence of the pain, by the use of lighter retentive apparatus.

Tuberculosis of either the lumbar spine or sacro-iliac joint needs appropriate fixation by plaster jacket or jacket-spica, together with general anti-tuberculous treatment and rest. In adults fixation of the spine by the Albee bone-graft is at times indicated. In children operation is rarely necessary, and in them also sciatica is seldom seen. In some cases of sacro-iliac tuberculosis, as well as in relaxation and chronic strain, the joint may be arthrodesed by the method of Smith-Petersen of Boston. This procedure, it is claimed, may be carried out even in the course of active tuberculosis of the joint with good results.

In the case of arthritis deformans of the hip-joint the problem is somewhat more difficult. In mild cases a tight flannelette spica may be applied with relief, while in more painful cases a plaster spica is beneficial. Tubby of London has, in the Practitioner, for December 1921, advocated strongly the use of traction in the treatment of this condition, to be followed by the use of an ambulatory Thomas knee splint which takes the weight off the leg and transfers it to the tuber ischii. A high sole is worn under the sound leg. In cases severe enough to warrant surgical interference the hip-joint may be arthrodesed, and such treatment applies equally to cases where the joint has been damaged by old fracture or even by old cured hip-disease.

In very acute cases of sciatica one will need to try many remedies. Tablets of aspirin or phenacetin or both in combination will be found of service when given frequently. Codeine is often helpful, but it will be found necessary to use morphine in most of the acute cases. Small blisters along the course of the nerve at times prove of service. Saline solution may be injected inside the sheath of the sciatic in the thigh. The leg will be found to be most comfortable when supported on, and fixed by, pillows. Hot lead and opium fomentations or the hot water bottle are of service. The electric warming pad has proved most valuable. In cases where the hip is involved longitudinal traction is often helpful. Plaster-of-Paris fixation is likely to be of service especially when the hip is involved. In cases of severe sacro-iliac or vertebral strain relief has been obtained by making a plaster bed for spine and both legs, with sufficient support to the lumbar curve. At the same time the pelvis should be tightly bandaged. An epidural injection of saline solution into the sacral canal may give relief lasting for hours. It may be said, in fact, that in the very acute cases of sciatica both the patient and his nerve have become very irritable, and time is necessary to bring the case to a point where more energetic measures may be instituted.

It may be that a few short case-histories will serve to illustrate some of the features which the writer has endeavoured to make clear. Take, for example, the case of a portly and dignified grandmother of sixty-five years, who complains that for months she has been unable, on account of sciatica, to accompany her husband on the daily walks in which they formerly delighted. On examination her spinal movements show restriction, she walks with pain. Tenderness is elicited over sacro-iliac and lumbo-sacral regions. One notices a heavy and pendulous abdomen, but good feet. Her teeth show many gold crowns, and the X-rays thereof show much that is lamentable. You perhaps, as the writer has often been glad to do, fortify your position by consulting high authority in the dental world. A very polite note, containing his recommendations, is written, and the patient is sent to her fashionable dentist, dental X-rays, letter and all. In the meantime a corset is made and fitted according to your specifications. The heavy abdomen is supported, and its weight distributed more evenly. No longer is it allowed to hang directly from the lumbar spine. The sacro-iliac and lumbo-sacral articulations are all firmly braced together most comfortably, and relief is at once begun. Visits to the fashionable dentist continue, and the patient's pain disappears gradually but surely. What has happened? This woman has had chronic non-tuberculous arthritis of the sacro-iliac and lumbar articulations, maintained by many abscessed teeth and aggravated by the weight of her heavy abdomen. Her special corset has put the irritated joints at rest and has supported the abdomen, while attention to the teeth has stopped the source of the arthritis.

As an example of severe trauma let us consider the case of a railway man lying motionless in bed in the hospital ward. He has been sent in from far away labelled "sciatica," the victim of a train wreck a month or more ago. Up to to-day his pains and disability have been unrelieved, and any attempts to move him cause agony. No fracture is revealed by the X-rays. By passing the hand cautiously under his back tenderness is elicited at one posterior superior spine, and it is noted also that pressure here starts up the pain radiating down his leg. A tight binder around his hips and pelvis gives appreciable relief, and this is taken as an indication that his sacro-iliac joint has been severely strained. As he lies in bed it is noticed that his lumbar spine is flattened out, the normal lumbar curve being obliterated. To remedy this, as well as to secure better fixation, a plaster bed is made,, supporting both spine and hips. Still further relief of the pain is experienced. Massage can now be tolerated, and before long a sacro-iliac brace is made for him, lacing tightly in front and kept in place by perineal straps, a pad applied to the affected joint posteriorly. Relief comes more quickly now that he can move about, and before long he is able to return home.

In a third case a man of fifty-five, undoubtedly the subject of arthritis deformans of the spine, has suffered from sciatic pain for years. All sources of infection, teeth, tonsils, intestinal tract, etc., so far as can be ascertained, have been eliminated. In fact, in his treatment attention has been almost exclusively directed to the cure of the arthritis, and apparently no thought of mechanical disability the result of arthritis has been entertained. The presence of suggestive tenderness over the posterior spine of the affected side led to the ordering of a brace supporting both sacro-iliac and lumbar articulations, with speedy relief. This case is interesting as an illustration of the way in which an arthritis, though cured, may leave in its train joint instability and weakness.

Bluish Discoloration of Umbilicus—In 1919, Cullen called attention to a "bluish discoloration of the umbilicus as a diagnostic sign where ruptured extra-uterine pregnancy exists." Some recent experiences with extra-uterine pregnancy have convinced Emil Novak, Baltimore (Journal A. M. A., March 4, 1922), of the value of this "blue belly-button" sign of Cullen. He reports two cases and calls attention to the fact that Cullen's sign would hardly be positive in cases of extra-uterine pregnancy which are not associated with intraperitoneal hemorrhage of considerable degree. Furthermore, severe intra-abdominal hemorrhage due to other causes than extra-uterine pregnancy might cause the umbilical discoloration as well. Cases of the latter type, however, are so rare that, to all interests and purposes, the sign may be considered one especially applicable to the diagnosis of ruptured extra-uterine gestation.– Jour. A. M. A., Mar. 4, 1922

NOTES ON TETANUS

H. H. Hepburn, M.D., C.M.,F.R.C.S., (Ed.); F.A.C.S.

University of Alberta, Edmonton, Alta.

IN Allbutt and Rolleston's System of Medicine (1908), Sir George Humphry defines tetanus as a virulent infective disease, characterized by continued contraction of the musculature of the patient, the spasms commencing in small groups of muscles and gradually extending to those of the whole body, especially the respiratory muscles.

I would be inclined to omit the last phrase of the above definition, the involvement of the respiratory muscles being the result of culmination rather than of special selection.

Up to the middle of the nineteenth century tetanus was regarded as the result of irritation of the brain and nervous system by divers agents. Tetanus following a local injury was spoken of as "traumatic tetanus." Another form was referred to as "spontaneous tetanus," and was thought to be due to irritation by climatic conditions, intoxication, psychic impulses, etc.

Sir James Simpson, in 1854, was one of the first to point out the close association of tetanus with the presence of wounds, which in those days were usually suppurating wounds. Drawing attention to the similarity of the disease to such conditions as eclampsia, which was recognized as being due to a poison circulating in the blood; and to the effects of poisoning by strychnine, he wrote: "It seems not impossible that the generation of a specific blood poison at the site of the wound, or elsewhere, may sometimes and in the same way give rise to obstetrical and surgical tetanus."

In 1885 Nicolaier produced tetanus experimentally in mice and rabbits by infection of wounds with earth and with pus from a tetanus patient. He described the causative organism but was unable to isolate it in pure culture. In 1889 Kitasato obtained a pure culture of the organism. It was soon fully described and proven to be the sole cause of the disease known as tetanus.

The causative organism is a slender bacillus, in length, about two-thirds the diameter of a red blood corpuscle, and with rounded extremities. It is easily stained by ordinary laboratory methods and is Gram positive. It grows best at about body temperature. It forms spores readily, sometimes in less than twenty-four hours. The bacilli are readily killed by exposure to a temperature of 60° C., but the spores will resist a temperature of 80° C. for one hour, and steam heat at a temperature of 100° C. must be applied for at least five minutes to kill all spores in a culture. Spores will survive for several hours in an aqueous solution of carbolic acid 1-20, or in solution of corrosive sublimate, 1-1000.

The organism is an-aerobic, and when excluded from air and light has been known to retain its vitality for at least twelve months, and will probably reproduce indefinitely as it is known to be endemic in the highly cultivated and artificially fertilized soil of certain countries. Its ability to survive for long periods in prepared cat-gut and gelatin is also well known, as cases of tetanus have unfortunately been traced to both of these sources in surgical practice. Historians have described the technique by which native tribes of Africa many years ago utilized tetanus-infected soil for the manufacture of poisoned arrows.

The toxic product of the tetanus bacillus is destroyed by a temperature of 65° C. in about five minutes, but if kept on ice will retain its toxic properties for many months.

The organisms do not tend to invade to any extent, either the soft tissues or the blood stream, but flourish locally under cover of necrotic tissues in the wound of entry. The toxin, however, can be demonstrated in the blood stream and in the cerebro-spinal fluid.

Evidence appears to be strongly in favor of the belief that the specific toxin is attracted by nerve cells of the spinal cord and brain, especially the former, and that the toxin reaches the nerve cell most directly and quickly by travelling along the axis cylinders of nerves whose end plates are distributed to the areas of infection. Secondary intoxication and general diffusion of the toxin are brought about by the circulation of contaminated lymph and blood. The revised memorandum of the British Tetanus Committee dated Oct. 25th, 1916, states that: "Tetanus toxin reaches the motor nerve cells by travelling up the nerves. It is not directly conveyed to the central nervous system by the blood stream."

The toxin acts as a stimulant to the motor nerve cells of the spinal cord, medulla, and pons, and to a much lesser degree, of the cerebral cortex.

The bacillus of tetanus when found in a wound is practically always in mixed infection, associated with a purulent discharge, but when introduced into the tissues in pure culture it does not as a rule produce suppuration. Consequently, in many cases where the initial site of infection escaped detection, the case has been erroneously recorded as a case of so-called "idiopathic tetanus."

It is now pretty generally conceded that any solution of continuity in skin or mucous membrane may serve as a point of entry for the tetanus bacillus, with or without the development of general tetanus.

The incubation period of tetanus varies greatly in different species of animals and also in individuals of a species. In man it is about four to twenty-one days, commonly seven to ten. Cases developing, as they sometimes do, several weeks or months after the date of wound and probable infection, are probably most correctly classed as latent or delayed tetanus. The period of incubation is followed by a period of local spasm, which in many cases is of short duration, and consequently, frequently unobserved by the surgeon. The period of local spasm is followed in typical cases by the stage of spreading, generalizing spasms, which spread from group to group of muscles until it frequently terminates fatally by involvement of the muscles of respiration or possibly of the myocardium. In some cases the spread of the disease is by some means arrested, and the case is then described as one of localized tetanus.

Generally speaking the shorter the incubation period, the higher is the mortality rate. During the late war, this observation was recorded and verified by figures in the bulletins published by the Royal Army Medical Corps as early as Jan. 28th, 1915. Personally I am inclined to regard any case with an incubation period of under six days as practically hopeless, whereas in cases with an incubation period of over ten days, the prognosis is comparatively favorable.

Prophylaxis and early diagnosis are most essential. By the time a patient has developed the clinical picture portrayed as diagnostic in most pre-war text-books, he has already reached a stage in the progress of the disease where the mortality is 70 to 80%. It is significant, even allowing for the increased prophylaxis, that in the first series of 109 cases occurring in the British Army in 1914, the R.A.M.C. records show a mortality of 73.39%, whereas in 1918 the mortality was 26.3%.

Following incubation, the period of primary invasion is frequently, especially in virulent cases, very brief. It may be only a few hours before generalized symptoms and signs become pronounced. The great war proved conclusively, if proof were still required, the great value of the prophylactic use of anti-toxic serum. Further, the value of serum as a therapeutic agent was shown to vary with the method of its administration and to be greatest when injected earliest, that is to say, before the nerve cells became saturated with the toxin. The observations of the British Tetanus Committee reported in the British Medical Journal of Sept. 25th, 1920, indicate that once the nerve cells have absorbed a lethal dose of tetanus toxin, serum treatment is of little, if any, avail.

The routine administration of a prophylactic dose of anti-tetanic serum to all patients suffering from wounds, abrasions, "trench feet," etc. produced a very marked fall in the incidence of the disease, and furthermore, it was found that when tetanus did develop after a prophylactic dose of serum had been given, the symptoms were less severe and the disease more likely to run a favorable course. The large number of cases of localized tetanus recorded was, no doubt, for the most part due to the prophylactic serum having prevented general spread of the disease by neutralizing the liberated toxin. Also it appeared to prolong or retard the period of incubation, and render the onset of symptoms less abrupt, thus giving more warning to the surgeon, and favoring treatment.

Among the earliest general premonitory symptoms are:- restlessness, insomnia, irritable temper, yawning, profuse perspiration, headache, vague pains in the back, and difficult micturition. By the time trismus and difficulty in swallowing have appeared, it can no longer be called an early case. An observant nurse will frequently suspect trouble by change in temperament of the patient before the surgeon is aware of it.

Locally there are important early signs which make it advisable to frequently examine the region of a wound in all cases where tetanus may be expected to occur. There is frequently, if not always, an early local increase in reflexes, with rigidity of the muscle, or part of a muscle surrounding the infected wound. Local rigidity and increased muscular excitability may be demonstrated, by gently tapping with the finger tips, the area surrounding the wound, especially when the wound actually involves a muscle. Increased complaint of pain during the changing of a dressing may be the first indication of this muscular excitability and cramp.

As a prophylactic measure anti-tetanic serum is usually injected subcutaneously; 500 U.S.A. units being the usual dose. Larger doses appear to be unnecessary as the immunity in any case wears off in about ten days in spite of larger doses being given. Consequently, weekly injections are recommended wherever the infection is feared.

As a therapeutic measure four methods of injection are practiced, i.e., (1) intra-thecal, (2) intravenous, (3) intramuscular, and (4) subcutaneous. I have not seen any authoritative opinion expressed on the local application of serum to an infected wound surface, but in the few cases where I tried it, I could see no indication of beneficial results.

Clinical experience confirmed by animal experiments, (B.M.J. Sept. 25, 1920) shows that serum acts most quickly when injected intra-thecally, and next, by the intravenous route. The intravenous route, however, is not recommended except for the first day of treatment when one wishes to neutralize toxin which has already found its way into the circulating fluids. The danger of anaphylaxis is greatest by this route, and the benefits most transient.

By intramuscular injection the neutralizing action of the anti-toxin is somewhat delayed, absorption of the serum being at its height in about twelve hours, but it has the advantage of extending the effects of the dose over a longer period and so preventing waste by elimination, which must necessarily occur when a concentrated dose is thrown suddenly into the circulation.

Subcutaneous injection is still more slow and is less certain of absorption. It may require over forty-eight hours to reach the height of absorption, consequently this is a poor therapeutic, but a good prophylactic, route.

Direct injection of serum into the trunks of large nerves has been tried, but the results have not been encouraging.

After analyzing the reports of many hundreds of cases, the British Tetanus Commission headed by Major General Sir David Bruce, K.C.B., F.R.S. recommended the following combination of methods:

(1) Intra-thecal injection of from one to three thousand units of anti-toxin immediately the development of the disease is suspected, supplemented by, (2) intramuscular injection of three to five, or even ten, thousand units. Both these injections should be repeated the second day, and preferably the third day. After the third day, intra-thecal injection is no longer necessary, and subcutaneous injection may be substituted for intramuscular if so desired, or combined with it.

If for any reason the intra-thecal route be inaccessible. I believe the first injection should be made intravenously, without delay, and repeated for two or three days.

When improvement becomes noticeable the injections may be lessened to every second day, along with reduction in the quantity, not going below five hundred units per week until the infected wound has completely healed.

In severe cases I have given as high as twenty thousand units in a day by combined methods, with the doses aggregating one hundred and seventy-five thousand units, and have credited recovery to the magnitude of the doses. Where large doses are to be given the use of high potency serum is recommended to reduce the amount of foreign serum injected.

Serum treatment should of course be combined with all other available means for combating the disease. All stimuli likely to provoke reflex motor response should, as far as possible, be prevented from reaching the patient. Nevertheless, the patient must be nourished, and the bowels evacuated.

Of the sedatives, morphin and chloral hydrate have proved most efficacious in my experience, and should be pushed until the clonic spasms are overcome. Omnopon may be substituted for morphia, as being less constipating. I have given morphin sulphate gr. 1/4 hypodermatically and chloral hydrate gr. XX per rectum, every two hours for twenty-four hours, and then morphin gr. 1/4 and chloral hydrate gr. X alternately every two hours for several days. I am accustomed to reduce the amount only when spasms are controlled or when the respirations become reduced to below ten per minute.

Any surgical interference with the wound after definite signs of tetanus have developed has usually proven to be of no avail, and at times appears to have hastened the spread of the disease by opening up new paths for absorption.

The application of oxidizing agents to the wound is advisable provided this can be done without much disturbance of the wound. Dakin's solution and Hydrogen peroxide are the two solutions most highly recommended.

Both the magnesium sulphate and the carbolic acid treatments have been condemned by the British Tetanus Committee (Oct. 25th, 1916.)

In performing spinal puncture for the injection of serum, I believe general surgical anaesthesia should be employed to minimize the shock. I have not seen deep anaesthesia do any harm, but have had the unfortunate experience of a patient expiring suddenly when the puncture was made under light anaesthesia, before any fluid was withdrawn or any serum injected.

Alarming symptoms of anaphylaxis following the therapeutic injection of anti-tetanic serum were seldom seen during the late war, in spite of the fact that many men were wounded and received injections of serum on two or more separate occasions, at varying intervals of time. I need hardly remind you that tetanus anti-toxin per se has nothing to do with the phenomenon of anaphylaxis. This condition is produced by sensitization to the protein of a foreign blood serum which is used as the vehicle for the anti-toxin. Consequently, it behooves us always to bear in mind the possibility of a patient having received a previous injection of serum of the same species, bearing a different anti-toxin.

A British army memorandum issued Jan. 1917, states that among the first four hundred and seventy cases of tetanus occurring since August 1914, only three cases of anaphylactic shock were reported. One patient died. It is possible that other cases did occur but probably not to an alarming degree, otherwise they would most probably have been reported, especially if fatal.

The method of desensitizing laid down in the above mentioned memorandum is as follows:-

Dilute 5 c.c. of serum with 50 c.c. of normal salt solution; of this mixture inject 1 c.c. intravenously; follow in four minutes with 3 c.c., and two minutes later with 10 c.c.; after another two minutes inject 25 c.c.: then in ten to fifteen minutes the full dose required may be given.

To detect the presence of sensitization in a patient, the following procedure is recommended:- Give a sub-epidermal, or intra-dermal injection of 0.4 c.c. of serum. In a sensitized patient a raised urticardial, or hyperaemic area from one to five centimetres in diameter will appear inside of thirty minutes.

The chief symptoms and signs produced by injection of serum into a sensitized patient are:- Pallor, sweating, air-hunger, dilatation of the pupils, rapid feeble pulse, a fall in blood pressure, and diarrhoea. The treatment is intravenous injection of adrenalin solution and atropin sulphate, the application of heat and usual measures employed to combat surgical shock.

The following is a summary of the cases of tetanus occurring in the British army during the late war as reported by the tetanus committee in the British Medical Journal of Sept. 25th, 1920.

One thousand four hundred and fifty-eight cases of tetanus occurred in the home hospitals of the United Kingdom during the years 1914-1918. This represented an incidence of 1.2 per 1000 of wounded treated in the same hospitals. The mortality among all cases occurring in the United Kingdom was 34.8% and of all cases occurring in the United Kingdom and France it was 47%. The mortality before serum prophylaxis was introduced as a routine was about 85%. The mortality for generalized tetanus without trismus was 24%. No death occurred in 201 cases of local tetanus. Sir David Bruce states that, "the occurrence of complete trismus inside of twenty-four hours was of grave import. Seven cases out of ten were fatal. When closure of the jaws occurred only after the other general symptoms developed eight cases out of ten recovered.

ON THE RELATIONSHIP BETWEEN THE ADRENAL GLAND AND THE THYROID*

Francis A. C. Scrimger B.A., M.D.

Montreal

IT is my belief that the next step to be taken in our knowledge of diseases of the thyroid will be a more clear differentiation between hyperthyroidism and that state known as exophthalmic goitre, and that this differentiation will be made by recognizing hyperthyroidism as a disease of the thyroid gland, and exophthalmic goitre as a disease of the thyroid in association with other members of the endocrine group, especially the adrenals.

It is well to recognize that toxic goitres fall in two main groups whose extremes are represented by the nodular thyroid with toxic symptoms as described by Plummer and Boothby, and the true exophthalmic goitre, the typical Graves' disease. These types have each moderately characteristic clinical history, a fairly definite pathological picture, and a course which we are learning to forecast with gradually increasing accuracy owing to a better understanding of the disease, and to newer methods of examination.

There is however a third, or an intermediary group, in which we find a relatively short history, and a bodily state approaching that of exophthalmic goitre, but without exophthalmos and other characteristic signs. The gland is symmetrically enlarged, and on section shows a colloid growth with areas of hyperplasia indistinguishable from the generalized hyperplasia associated with true Graves' disease. There may be a high metabolic rate of forty, fifty or even sixty above normal. These cases stand operative procedure well, and promptly return to normal after removal of the thyroid, in contrast to the exophthalmic cases of no greater severity, which will return to normal only after long months if at all.

We must either believe with Crile that "Iodine alone, adrenalin alone, thyroid extract alone, emotion exertion or infection alone each cause a kinetric drive with resulting phenomena similar to those of exophthalmic goitre," or that in the one type the disease is a disease of the thyroid; in the other the thyroid plus something else is at fault. That someching else may well be the adrenal or other of the ductless glands.

There is much evidence, some of it vague and unproved, some of it well based on experiment to point to the physiological association of the thyroid and the adrenal, to emphasize the similarity of the effects produced by the two secretions, and to demonstrate the mutual reaction of the one gland to demonstratefilz fiflffemrhd of the one gland on the activity of the other.

For this reason I have considered it worth while, in an evening devoted to the discussion of thyroid disease to gather together for you shortly what is known of the activities of the adrenal so far as it is related to the activities of the thyroid.

It is needless to remind you that the adrenal gland is composed of two separate parts, the cortex derived embryologically from the same tissues as the ovary and the gonad; and the medulla, which takes origin from the same cells as the sympathetic, and is chromaffin in nature.

Of the function of the cortex little is known with certainty. Its disturbance is associated with curious changes in the secondary sex characteristics. One rather attractive theory gives to it the function of inhibiting medullary activity; and a growing importance as with the more complex nervous systems the cerebral control tends to become dominant over the sympathetic. There is little or nothing to associate the cortex with the thyroid. It is otherwise with the medulla and its product adrenalin.

There are two theories in the field as to the function of the adrenal medulla. These may be spoken of as the tonus theory and the emergency theory. The tonus theory regards the adrenal as a factor in the maintainance of tone of smooth muscle through the sympathetic, not necessarily always a blood pressure raising action, because it has been shown that small doses may lower blood pressure generally; the vessels of the lungs, brain, and heart are said to be unaffected; the peripheral vessels are contracted while those to the muscles are dilated. These several actions may indicate a governing or controlling power which under call can throw a large circulation into the lungs, brain, heart and muscles at the expense of the viscera and peripheral vessels.

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*Read before the Montreal Medico Chirurgical Society, January, 1922.

The second theory is the emergency theory put forward by Cannon, in which it is held that little or no adrenalin is sent into the circulation under normal quiet existence; but that under the influence of pain, asphyxia or emotional disturbance adrenalin is poured into the circulation where it heightens the effect of the sympathetic impulses, increases the irritability of fatigued muscle, stimulates to activity the thyroid and other glands, and concentrates the circulating blood to the best advantage for violent physical activity. In other words it enables the exhausted man under strong emotion, to get up and fight, to go without food and rest, long past his normal powers.

It has not been conclusively proved that under normal quiet existence adrenalin is found in the circulating blood. It has been proved that it is liberated into the blood under stimulation of the sympathetic.

Clinically it has been shown that a large proportion of patients suffering from hyperthyroidism react with normal sensitiveness to adrenal secretion, as illustrated by the well known Goetsch test, which is based on the belief that thyroid sensitizes the sympathetic nerve endings to the action of adrenalin. Both the thyroid and the adrenal are under the common control of the sympathetic. Both sensitize the sympathetic to the action of the other's secretion. Each stimulates the other's secretary activity. Here we can easily see how one of nature's vicious circles may arise. Under emotional stress the thyroid and adrenals are stimulated to activity; the thyroid sensitizes the sympathetic nerve endings to the action of adrenalin, and at the same time increases the quantity of adrenalin liberated. Adrenalin everywhere in the body duplicates the action of sympathetic impulses and augments them. It also stimulates, probably through this action, the liberation of the thyroid secretion.

An excessive supply of adrenalin, unbalanced by possibly the pituitary or the adrenal cortex, through its action on the sympathetic is believed to produce that state of body known as sympatheticotonus; delayed peristalsis, rapid pulse, flushing of the skin, rise in temperature, increased metabolic rate, raised blood pressure and closely resembling Graves' disease as to be with difficulty distinguished from it. I have already pointed out that there is evidence to show that increased activity of the thyroid will result in increased activity of the adrenal, hence the recognition of the sympatheticotonic and the vagotonic types of hyperthyroidism. It is reasonable to expect that a deficiency of adrenalin may result from over stimulation, and it is claimed that such a deficiency, indicated by "Sergeant's white line" has been produced by over medication with thyroid. Such a state is associated with muscular weakness, easily induced fatigue, and incapacity for effort.

It has been proved that both thyroid and adrenal are stimulated to secretion through the sympathetic. It has been proved that adrenalin duplicates in the body the action of the sympathetic; it has also been proved that adrenalin has the same effect on the thyroid as has stimulation of the sympathetic and that it does not do this through its action on the blood pressure. Fraenkel has claimed to have found in cases of exophthalmic goitre adrenalin present in quantities two to four times the normal. Asher and Flack believe that the phenomena of exophthalmic goitre can be ascribed to the action of adrenalin upon the structures rendered sensitive by thyroid. There is then a gradually increasing pressure of evidence associating these two gland products under normal and diseased conditions which make it imperative for the understanding of exophthalmic goitre, that the influence of the adrenal should be considered, studied, and if possible, determined.

DIFFERENTIAL DIAGNOSIS OF DISEASES OF THE THYROID GLAND*

John Phillips, M.B.

Cleveland Clinic

THE thyroid gland, consisting of two lateral lobes and an isthmus, surrounds the trachea like a horse shoe. The isthmus covers the second and third ring of the trachea and occasionally extends upwards in front of the thyroid cartilage or even the cricoid. Special bands of connective tissue known as the cricothyroid or suspensory ligament pass upwards from the isthmus and lateral lobes of the thyroid to form an attachment with the cricoid cartilage. This attachment is important because it is responsible for the movement upwards and downwards of the gland during deglutition. Sometimes the thyroid has also a pyramidal lobe which extends upwards in the median line from the isthmus to the hyoid bone. This represents the remnant of the thyroglossal duct and may be the site of a struma or a cyst. Accessory thyroid glands are sometimes present, being situated in the neck in the neighborhood of the hyoid bone and below the thyroid, or in the mediastinum as low down as the arch of the aorta.

The posterior and inner surfaces of the lateral lobes of the thyroid lie in contact with the cricoid and thyroid cartilages, the trachea, œsophagus, inferior laryngeal nerve and the inferior constrictor of the pharynx. It is important to remember these relationships because when the gland is enlarged pressure on these structures gives rise to definite symptoms. In front of the lateral lobes lie the superficial muscles of the neck—the sternohyoid, sternothyroid, omohyoid and a small portion of the sternomastoid muscle. To the outer side of and posterior to each lateral lobe, and covered by the sternomastoid muscle lies the carotid sheath, containing the common carotid artery, the external jugular vein, and the vagus nerve. When this lobe is enlarged, the carotid artery is displaced outward and backward. This outward displacement serves to differentiate thyroid enlargements from glandular swellings or tumors in this region as the artery passes centrally through the inflammatory mass.

One of the two superior thyroid arteries enters the superior pole of each lateral lobe, one of the inferior thyroid arteries enters each inferior pole. In many cases of goiter, these arteries are considerably increased in size so that a distinct pulsation can be felt throughout the entire gland. The small ima arteries which usually arise from the aorta enter the lower portion of the isthmus from which the corresponding veins pass to the innominate veins. The latter are of importance because they are sometimes the seat of air embolism. One of the recurrent laryngeal nerves passes to the inner side of each lateral lobe, a position which renders it liable to compression by a struma or to injury during the surgical removal of a goiter, with resultant paralysis of the abductor muscle of the corresponding vocal cord.

Various complicated pathological classifications of diseases of the thyroid gland have been worked out by different observers, from among which, I think the following headings are most convenient for the practical consideration of the clinician:

(1) Simple goiter which includes the hyperplasias of the gland seen at puberty.
(2) Colloid goiter
(3) Adenoma of the thyroid
(4) Exophthalmic goiter, hyperthyroidism
(5) Myxœdema, hypothyroidism
(6) Tumors of the thyroid gland
(7) Inflammations of the thyroid

Simple Goiter

Under the term simple goiter are included the hyperplasias of the gland which are very frequently seen at puberty or in adolescence.

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*Read before Hamilton Medical Society, Sept. 15, 1921.

These occur more commonly in certain districts among which the region of the Great Lakes is one of the most important in this country. As a rule, in simple hyperplasia, there is a diffuse enlargement of the entire gland affecting equally all its parts, although in some instances, one lateral lobe will be more enlarged than the other. In cases of simple goiter, the size of the gland increases during menstruation, and also during pregnancy. As a rule there are no symptoms present in these cases and treatment is usually sought because of the disfigurement of the neck. The diagnosis of simple goiter is easy and its differentiation from other conditions presents no difficulty.

Colloid Goiter

The only symptoms presented by colloid goiter are those due to the resultant compression of the surrounding structures. Like the simple goiter, a colloid goiter may present a uniform enlargement of the entire gland or one lobe may be much more enlarged than the other. The muscles covering the growth may become stretched and if the goiter is of great size, the superficial muscles may not be sufficient to support it so that it may descend from its own weight and become almost pendulous. The larynx and trachea may become compressed, the character of the resultant deformity of these structures depending upon the relative enlargement of the different portions of the gland. Thus, if the isthmus is enlarged, there will result an antero-posterior compression. If one lateral lobe is particularly enlarged, the trachea may be compressed and displaced to one side; or if both lateral lobes are greatly enlarged, the trachea may be flattened from side to side. If the enlargement in the two lobes is at different levels, the trachea may assume an S shape. As a result of this tracheal compression, the patient may have great difficulty in breathing with a resultant inspiratory stridor. The patient may have a persistent, irritating cough, which differs from the cough which results from compression of the recurrent laryngeal nerve, the latter occurring in paroxysms and being of a curious resounding character without any definite expectoration. If the eosophagus is compressed there will be difficulty in deglutition, especially when the patient attempts to swallow solids. The blood vessels may be very much displaced, particularly the common carotid which is displaced outwards. As the goiter enlarges, it may descend into the superior mediastinum and give rise to trouble there as the result of compression of the mediastinal contents.

Intrathoracic Goiter

Sometimes an enlargement of the lower portion of either lateral lobe or the isthmus, may descend within the thoracic cavity and form the complication called intrathoracic goiter. Sometimes such a goiter develops from an accessory gland in the superior mediastinum. The superior mediastinum is bounded in front by the manubrium sterni and the upper three ribs, posteriorly by the upper three dorsal vertebrae, in front of which lie the trachea and the eosophagus, and below by the arch of the aorta. Goiters which arise from the isthmus and lie in the median portion of the mediastinum compress the trachea and the eosophagus, and may also displace the aorta downwards. In cases of enlargement of the lateral lobe of the thyroid, the trachea may be displaced and compressed from side to side, and if there is a double intrathoracic goiter involving both lobes, the trachea may be twisted on itself, as well as compressed, thus resembling the deformity seen in scoliosis of the spine. There is always a great deal of interference with the venous trunks, in some instances even to the extent of causing almost complete occlusion of the superior vena casa as is illustrated by the following case:

The patient, a male, 62 years of age, was seen first on March 7th, 1921. He had always been well until ten years ago when his face began to swell, his lips and face became cyanosed, and the veins over his body, particularly over the chest and neck were very much distended. He had never been very short of breath, and never had any choking spells. He had noticed for at least ten years or more that he had a goiter, but had never been troubled with palpitation of the heart, and had only occasionally noticed a shaking of the hands.

Examination showed a well marked cyanosis of the face and hands, particularly of the lips. The eyes showed a moderate exophthalmos, with some slight lagging of the upper lid on looking downward and increased width of the palpebral fissure. There was no ocular palsy. There was an enlargement of the thyroid gland, particularly of the right lobe which contained a hard, firm adenomatous nodule about the size of a hen's egg. There was also a similar nodule in the isthmus about the size of a hickory nut. The jugular veins were very much distended, and there was extreme distension of the veins over the chest and antero-lateral portions of the abdomen as shown by the accompanying picture. (Fig. I)

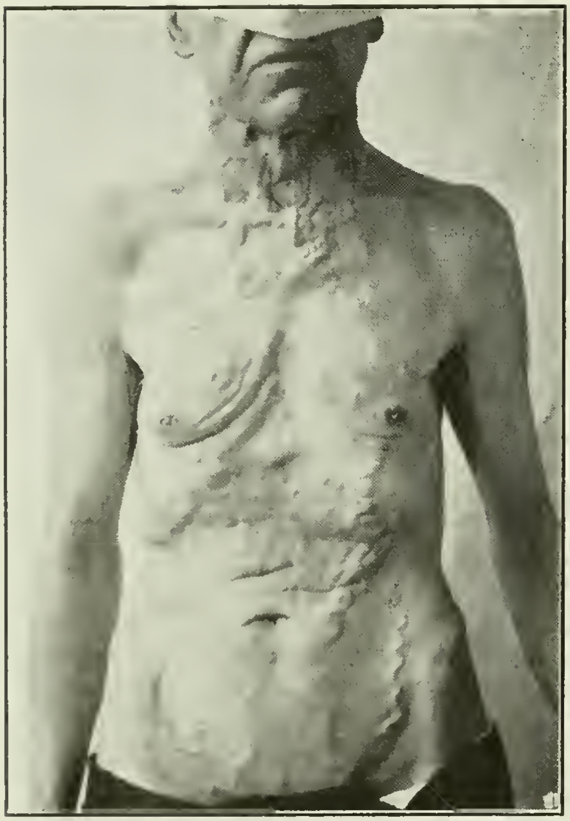

Fig. I,—Venous Thrombosis from Obstruction due to Intrathoracic Goiter.

The examination of the chest showed diminished expansion of the base of the right lung. There was increased tactile fremitus at the apex of the right lung in front and behind, while at the base of the right lung from the angle of the scapula downwards the tactile fremitus was absent. The tactile fremitus over the left lung was normal. There was more or less impairment of resonance all over the right side of the chest with dulness over the base of the right lung from the level of the angle of the scapula downwards. There was also extensive impairment of resonance in the first, second and third interspaces below the clavicle. Over this latter area, the breath sounds were bronchial in character, and a few coarse râles could be heard. Over the base of the right lung posteriorly, there was almost complete absence of breath sounds.

The heart was enlarged in both diameters, with a systolic murmur at the apex. The pulse was somewhat irregular, arhythmic, rate 100: blood pressure, systolic 126, diastolic 76. The liver edge could be easily felt and there was œdema of the lower extremities. The Wassermann reaction was negative. The urine showed a trace of albumin, and some granular casts. The blood count showed R.B.C. 4,290,000, W.B.C. 6,400, and Hg 80 per cent. The differential count showed polymorphonuclear neutrophils 60 per cent., small lymphocytes 32 per cent., large lymphocytes 2.5 per cent., and transitionals 5.5 per cent. The blood chemistry showed blood urea 29 mgm. per 100cc, blood sugar 112 mgm. per 100 cc, and blood chlorides 580 mgm. per 100 cc.

Fluoroscopic examination of the chest revealed a homogeneous shadow occupying the entire upper lobe of the right lung. The aortic arch was prominent. The trachea was not displaced. The mass was definitely connected with the mediastinum and pulsated, but not with the expansile pulsations characteristic of aneurysm. On deep respiration and deglutition, the shadow did not separate from the aortic shadow.

The oblique view was of no aid in determining the character of the mass. The entire lower lobe of the lung was consolidated, having an irregular upper border with a dense base, the picture indicating fluid in the base with an inflammatory process above. The middle lobe of the lung was free from involvement. The heart was apparently normal in shape and position but somewhat increased in size. From the fluoroscopic findings, the diagnosis was probable aneurysm. Plates of the chest were made which confirmed the fluoroscopic findings with the exception that a rather indistinct regular shadow could be seen within the homogeneous mass. This was interpreted as a probable saccular aneurysm with luetic involvement of the rest of the lung.

In addition to this, the diagnosis included adenoma of the thyroid, chronic myocarditis with beginning decompensation, and hydrothorax with infiltration at the base of the right lung.

The patient was advised to rest, and 15 minims of tincture of digitalis and 5 grains of sodium iodide three times a day were prescribed. We expected him to return in two weeks for further observation, but he did not return until September 12th, 1921. He had been taking the iodide regularly, and had lost forty pounds in weight; the œdema of the extremities had disappeared, and his cyanosis was somewhat decreased. His pulse rate, however, had increased to 120. He showed a marked tremor of the hands, his skin was very moist, and he had been troubled with diarrhoea.

Examination of the chest showed that there was some diminution in the area of dulness below the clavicle on the right side. The signs of fluid at the base of the right lung had disappeared. X-ray examination of the chest at this time, plates giving anterior, posterior and oblique views being taken, showed quite a contrast to the picture taken at the first examination. All the inflammatory involvement of the upper lobe had disappeared, excepting for a dense, thickened pleura between the upper and the middle lobes extending to the periphery of the lung. The shadow which was seen within the mass at the first examination, in these plates appears distinct and clear, and in the oblique view is seen to be continuous with a goiter shadow in the neck, and separated from the aorta. (Figs. II and III)

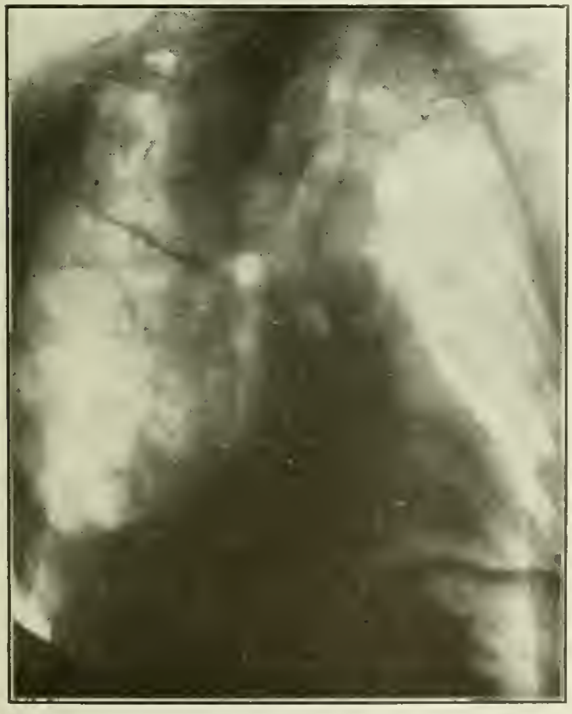

FIG. II.—Radiograph of Patient Shown in Figure I, Showing Well-defined Outline of Intrathoracic Goiter.

There is very little doubt that the development of the symptoms of hyperthyroidism was due to the long continued administration of sodium iodide because in the past month, since the iodide was discontinued, the patient has begun to gain in weight, the tremor of the hands is less, and he is not so conscious of the palpitation of the heart.

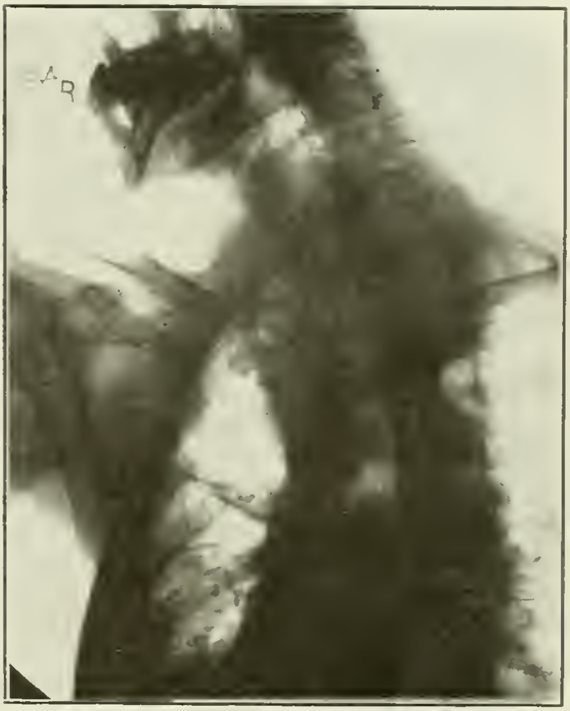

FIG. III.—Radiograph of Patient Shown in Figure I, Oblique View.

To sum up this case, there seems to be very little doubt but that the patient has a large intrathoracic goiter extending downwards from the right lateral lobe and that the enlargement of the veins of the trunk and neck which came on about ten years ago was due to the resultant compression and thrombosis of the superior vena cava.*

The outstanding subjective symptoms of intrathoracic goiter are therefore, as one would expect, the mechanical result of the position and degree of enlargement in the individual case.

Dyspnoea, which is usually continuous and associated with an inspiratory stridor is present in most cases. In some instances, there may be choking spells which are very serious. These are more likely to occur when the intrathoracic goiter is not very large and is situated in the median line so that it may slip in and out of the superior strait of the mediastinum.

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*The patient died shortly after the last visit. At autopsy an intrathoracic goiter, the size of an orange, was found extending from the lower pole of the right lateral lobe. The right innominate vein was completely obliterated by fibrosis resulting from the organization of a thrombus.

Coughing is another troublesome symptom. This is due either to the irritation of the trachea resulting from compression, or in some instances to irritation of the recurrent laryngeal nerve. Hoarseness from the same causes is also present. Sometimes these patients complain of wheezing which is also due to compression of the wind pipe. Dysphagia, especially difficulty in swallowing solid food, is not an infrequent symptom.

Cardiac disturbance is sometimes present in cases of intrathoracic goiter as the result of compression and resultant irritation of the sympathetic and vagus nerves. This may manifest itself in tachycardia, bradycardia, and various cardiac arhythmias. Sometimes there may be attacks of paroxysmal tachycardia.

On physical examination, one of the most striking features of intrathoracic goiter is the distention of the veins in the upper part of the thorax. These veins may be quite large, and extend outwards over the shoulders, as shown in the case described above. Their enlargement is more marked on one side than on the other, depending upon whether the goiter arises from the right or left lateral lobe. On palpation, when the patient swallows, sometimes the upper part of the intrathoracic goiter can be felt to ascend into the superior strait. Displacement of the trachea to the right or left may also be noted. On percussion, retrosternal dulness can often be made out or dulness on either side of the sternal border.

Fluoroscopic examination is of great assistance in the diagnosis of intrathoracic goiter. The tumor shows a convexity laterally, and if the goiter is nodular the surface may be uneven. The tumor may pulsate because of its close proximity to the aorta. For this reason, it may often be difficult to differentiate between an intrathoracic goiter and aneurysm. Under the fluoroscope however, it will be seen that excepting in malignant cases the intrathoracic goiter changes its position during inspiration and expiration, and also during the act of swallowing so that an angle is formed between the tumor and the ascending aorta whereas the shadow of an aneurysm remains continuous with the aorta.

Adenoma of the Thyroid

Adenomata of the thyroid are manifested by an enlargement of the gland that is nodular in character. They may be single or multiple, and vary greatly in size. They can be readily differentiated on palpation by the fact that usually they are harder in consistency than the other portions of the gland. In some instances however, they become cystic, and then are quite soft in consistency. Occasionally calcification occurs. Adenomata of the thyroid are much more likely to cause asymmetrical enlargements of the thyroid than any other condition. Sometimes hemorrhage may occur in them as the result of severe exertion. One such case I saw five years ago in a boy 16 years of age, who, while wrestling with some other boys at the place where he was employed, developed a sudden acute swelling of the neck which caused considerable difficulty in breathing because of its compression of the trachea. This however subsided in the course of ten days, and most of the swelling entirely disappeared.

In the majority of cases, the general symptoms of adenomata of the thyroid differ in no way from the symptoms of colloid goiter. In other words, as a rule the only symptoms are those resulting from the compression of the surrounding structures. This is not always true, however, because sometimes hyperthyroidism may develop in cases with adenomata. One interesting feature of the cases of adenomata with hyperthyroidism is that the toxic symptoms as a rule do not develop until after the adenomata have been present for a number of years and they are more likely to be accompanied by cardiac disturbances in the form of arhythmia and myocardial changes than the ordinary case of hyperthyroidism. This characteristic probably is the result of the long-continued toxæmia.

Exophthalmic Goiter or Hyperthyroidism

Other names applied to this condition are toxic goiter, thyrotoxicosis, Basedow's disease, Parry's disease, Graves' disease. Sir William Osler has stated that if the name of any one physician is applied to the disease, the credit should go to Parry.

The cardinal symptoms of exophthalmic goiter are: (1) the presence of an enlarged thyroid or struma; (2) exophthalmos; (3) tremor; (4) tachycardia.

Changes in the thyroid gland: The thyroid may show a symmetrical enlargement, although in some cases, there may not be very much increase in the size of the gland. However, physical examination of the thyroid does not always give us a true estimate of the size of the gland, as at operation, some of the cases in which the gland appears quite small, will show quite marked enlargement. Sometimes the gland is firm and presents a granular feeling to the palpating hand on account of the irregularity due to hyperplasia; at other times, it feels soft, almost cystic. The superior thyroid artery can often be felt to pulsate much more vigorously than in the normal gland. In fact, the whole gland may show an expansile pulsation almost like that of an aneurysm. Frequently, as a result of the increased vascularity, a systolic murmur can be heard. Occasionally also, a thrill can be felt on palpation.

Eye signs: The eye signs present some of the most characteristic features of this disease. There is a noticeable staring expression and exophthalmos, usually bilateral but occasionally unilateral, is present in a large proportion of the cases. The degree of exophthalmos varies a great deal, sometimes being so extreme that the eye ball is displaced from the socket. Riesman has described one rare instance in which a murmur was plainly audible over the ball of the eye. There is a lagging of the upper lid on looking downwards (Von Graefe's sign). The slit between the two eyelids is widened so that even the sclera will show between the lid and the iris (Dalrymple's sign). There is infrequent winking (Stellwag's sign), and the power of convergence is often decreased (Moebins' sign). There may be epiphora or the tears may be diminished. In occasional cases, paresis of some of the external ocular muscles has been described. Sometimes, too, there is quite a marked pigmentation of the eyelids.

Vascular symptoms: Tachycardia is such a common symptom that the presence of Graves' disease should be suspected in any case in which there is a persistently rapid pulse. The rate may vary from 90-100 in the milder cases to 160-180 in the more severe cases. The volume of the pulse is large, and there is a marked throbbing of all the accessible arteries. The patient also complains of a subjective sensation of throbbing. This is particularly marked when he puts his head on the pillow at night. Various forms of cardiac arhythmias are present and in the late stages of exophthalmic goiter, there may be well defined signs of myocardial degeneration and cardiac decompensation. The heart may show some enlargement, and a systolic murmur may be heard over the precordium. The blood pressure may show very little change except that the systolic pressure may be slightly increased, and the diastolic may be lower than normal. In other words, the pulse pressure is increased.

Blood changes: The most characteristic change in the blood picture in hyperthyroidism is the presence of a moderate degree of lymphocytosis.

Vasomotor and trophic symptoms: One common subjective symptom is the sensation of warmth and there is a tendency to flushing of the skin. The skin as a rule is very moist and has a soft feeling. There is very free perspiration of the extremities, and from the arm pits. Dermatographia is nearly always present and the pilomotor reflex is increased. Very often there is pigmentation of the skin. This may occur on various parts of the body but is most marked on the face. Occasionally, well defined areas of vitiligo or leucoderma are seen on the neck or other parts of the body or extremities. The hair is scanty on the body, and the hair on the scalp has a tendency to fall out. Very often, the nails show signs of degeneration. Pruritus may be a persistent and unpleasant symptom.

Respiratory symptoms: The respirations are increased in rate and are superficial and irregular. The excursion of the chest shows a diminished amplitude. The patient complains of shortness of breath and at frequent intervals will take a very deep inspiration to overcome the feeling of air hunger. The voice is often hoarse, and the patient is often troubled with a cough. These last two symptoms may be due either to a compression of the trachea or to interference with the recurrent laryngeal nerve.

Digestive disturbances: In the early stages, the appetite, as a rule, is increased. In fact, the excessive appetite presents a strong contrast to the great loss in weight. In the later stages however, there may be persistent nausea, vomiting, and belching of gas. Very frequently too, diarrhoea is a troublesome symptom.

Urinary and genital symptoms: Frequency of urination, and the passage of large quantities of urine are not uncommon symptoms. There is a diminished tolerance to carbohydrates so that often sugar will appear in the urine. Sometimes there is a sexual hyperexcitability but usually there is a diminution both of libido and of potentia.

Metabolic disturbances: In a severe case, the patient loses weight very fast. This is due to the rapid oxidation of the tissues and the burning up of his own tissue protein. Therefore, the basal metabolism as shown by the calorimeter is greatly increased. Estimation of the basal metabolism is therefore a valuable diagnostic measure in cases of hyperthyroidism. There is also an increased sensitiveness in these patients to the injection of adrenalin. This sensitiveness is manifested by increase in the rate of the heart beat, by increased blood pressure, and by hyperexcitability after an injection of five to seven minims of adrenalin (Goetsch test). Cases of toxic goiter often have a slight elevation of temperature.

Nervous and mental disturbances: Patients with exophthalmic goiter are extremely nervous and apprehensive. In many instances, they seem to be in the state of constant fear. Very often they are irritable and given to fits of temper. They are very restless and as a rule, the mental processes are not as keen as when they are in normal health. Sometimes they are quite forgetful. In severe cases, the mental symptoms may take the form of an active delirium. In others, there may be great depression amounting to melancholia. A fine tremor of the hands varying in rate from 7 to 10 per second is a striking feature.

Muscular symptoms: These patients complain of great weakness and extreme exhaustion after any severe or prolonged effort. Sometimes they complain of a sudden giving away of the knees. At times too, they have muscular cramps of the extremities.

Differential Diagnosis of Hyperthyroidism

Neurasthenia: In the differential diagnosis of cases of hyperthyroidism, we must take into consideration the fact that it is very difficult to differentiate some forms of nervous exhaustion or simple neurasthenia from the mild cases of hyperthyroidism. In a case of neurasthenia however, the pulse slows down to normal as soon as the patient is put at rest and the basal metabolism is not increased.

Neuro-circulatory Asthenia: Another condition which has given rise to a great deal of difficulty in differential diagnosis is the neuro-circulatory asthenia, (irritable heart), which was seen so frequently among soldiers during the last war. This condition, which was first described during the Civil War by Da Costa, simulates hyperthyroidism very closely. It occurs after infections or in individuals who have shown evidence of physical inferiority from the time of birth. These individuals were delicate as babies and very often presented evidence of rickets. As they become older they are unable to take part in the games with other children, and when they reach the age of taking up some trade, they always choose some line of work which requires very little physical exertion. These patients complain of dizziness when standing in an upright position; they also complain of palpitation of the heart and throbbing of the vessels, they often complain of pain in the precordium and of tenderness of the pectoral muscles. They perspire very freely, and very often faint when they stand for a long time. Many of these cases have digestive disturbances and a large proportion of them have visceroptosis. The cardiac rate, as stated above, is very much increased. They have tremor of the fingers and cyanosis of the hands, very free perspiration, and very marked dermatographia.

In fact, in many instances, the absence of ocular symptoms and the absence of goiter are the only points of differentiation between neuro-circulatory asthenia and hyperthyroidism. Many observers think that there is a very close relationship between these conditions and I am inclined to believe that this is true. In the majority of cases, however, basal metabolism estimations in these patients have not shown an increase in rate.

Pulmonary tuberculosis: Another condition which must be kept in mind in the differential diagnosis of hyperthyroidism is pulmonary tuberculosis. Many cases of early pulmonary tuberculosis do not show any very definite evidence in the lungs and may complain only of exhaustion and an increased pulse rate. It is, therefore, always important in making a diagnosis of what appears to be a mild case of hyperthyroidism to be on the look out for pulmonary tuberculosis.

Paroxysmal tachycardia: Cases of paroxysmal tachycardia, because of their nervousness, anxiety and increased pulse rate, may be confused with hyperthyroidism when seen for the first time. A careful history, however, will show that, except for some shortness of breath, the patient has been in normal health and that the onset of tachycardia has been very sudden and the return to the normal cardiac rate equally sudden. However, one must bear in mind the fact that hyperthyroidism is often complicated by attacks of paroxysmal tachycardia.

Myxoedema

Myxoedema may be congenital in origin, in which case it is due to the absence of the thyroid gland (thyreo-aplasia); or it may occur late in life as the result of a deficiency of thyroid secretion or as the result of the removal of too much of the gland at operation.

In cases of *congenital myxoedema* the child fails to develop mentally or physically. The head is brachycephalic in type and the fontanelles remain open. The child has a dull, heavy appearance, the tissues are very thick and dry, the hair is scanty and dry, there is a sacculation under the eyelids, the face is swollen, the nose broad and flat, the lips are thick, and the tongue is enlarged, protruding between the lips. The voice is husky and coarse. The abdomen is protuberant and there is a tendency to umbilical hernia. The child develops very slowly mentally so that at the age of ten, he may not be any further advanced than a child of two. The extremities are short and the hands are thick and pudgy. The bones ossify very slowly so that the ossification of the bones in a child of twelve may not be any farther advanced than in a child of five. In the superclavicular regions there are large pads of fat. The temperature is persistently subnormal.

This condition must be differentiated from *Mongolian idiocy*. In cases of Mongolian idiocy, the tissues are not thickened as much as in myxoedema; the tongue is not as much enlarged and does not protrude so far between the lips; and there is a curious slanting of the eyes downwards and inwards toward the nose which is absent in myxoedema. In Mongolian idiocy the antero-posterior diameter of the skull is very much decreased; the eyes are set closely together, the palpebral fissure is narrow and there is frequently epicanthus; the hands of the Mongolian idiot are short and thick, and the little finger is so short that often it does not reach to the last interphalangeal joint of the ring finger. Congenital heart disease is much more common in the Mongolian idiot than in cases of myxoedema. Relaxation of the ligaments of the joints is a striking feature so that the extremities can be put in almost any position with ease. But the most important feature in the differentiation between congenital myxoedema and Mongolian idiocy is the presence or absence of the slanting eyes described above.

Achondroplasia is another condition which is occasionally mistaken for cases of congenital myxoedema. The characteristic feature of this disease is the shortness of the arms and legs, as compared with the length of the body. In cases of achondroplasia, moreover, the intelligence is normal, and the thyroid gland can be easily palpated.

In *adult cases of myxoedema*, which are found more frequently in women than in men in the proportion of four to one, the most striking symptoms are a feeling of chilliness, a tendency to drowsiness, increase in weight, dryness of the skin, loss of hair, and change in the voice. The subcutaneous tissues are very thick and the patient's weight is increased. The facial features are greatly altered. The lines of expression of the face are gone, the eyes are full and heavy, there is sacculation under the eyes, the nostrils are broad and thick, the lips are thickened, and the voice is husky. Pads of fat are present in the supraclavicular region. Although there appears to be a swelling of the subcutaneous tissue, it will not pit on pressure. The temperature is subnormal, and the basal metabolism rate is from 20 to 40 per cent. below normal. There is an increased tolerance to carbohydrates. The memory is defective; the patients are often irritable and suspicious; and in some instances they pass into a condition of dementia. The thyroid is diminished in size and may become completely atrophied. These patients show a tendency to arteriosclerosis with arterial hypertension and myocardial degeneration. With the dryness of the skin there is almost complete absence of perspiration and the sensation of touch is impaired. Patients with myxœdema often complain of rheumatic pains in various parts of the body. The hands and feet are thick and clumsy, the fingers are enlarged and lose their dexterity. To this condition of the hands Gull has aptly applied the term "spade hands." Menstruation is often suppressed and there is a diminution in the sexual desires of both sexes. The blood shows a diminution in the number of red corpuscles and a correspondingly greater reduction in hæmoglobin. The white cells show a leucopenia and a hyperlymphocytosis.

Because of the anæmia cases of myxœdema have sometimes been diagnosed as *pernicious anaemia*. In the latter condition, however, there is no infiltration of the subcutaneous tissue, and the blood findings serve to establish the differentiation. In pernicious anæmia, the color index is high, the anæmia is more marked, the presence of nucleated red corpuscles and the characteristic changes in size, shape and staining properties of the red cells make the diagnosis easy. Moreover, in pernicious anæmia, pathological changes in the central nervous system, with the characteristic symptoms and physical signs, are found in 70 per cent. of the cases.

The infiltration of the tissues in myxoedema has led this condition to be incorrectly diagnosed as *nephritis*. In the latter disease the tissues pit on pressure, and if there is much oedema fluid accumulates in the serious sacs. The urinary findings together with functional kidney tests will render the diagnosis clear.

Hypopituitarism: Cases of hypopituitarism are sometimes incorrectly diagnosed as myxœdema. I have seen two instances of this error in diagnosis within the past six months. In hypopituitarism the skin is soft, the body practically hairless. In the male the distribution of the pubic hair when present resembles that of the female, the sexual organs are imperfectly developed, the configuration of the body and the development of the breasts resemble those of the female. The voice is high pitched. The fingers are long and tapering. In cases of hypopituitarism various grades of enlargement of the sella turcica are seen and bitemporal hemianopsia may be present.

Tumors of the Thyroid

Tumors of the thyroid may be benign or malignant, and usually develop in a pre-existing goiter. Of the benign tumors, the most common are the adenomata, which we have described above; such growths as fibromata, lipomata and echinococcus cysts, being so rare as not to warrant much consideration. Occasionally adenomata may become malignant. The most important malignant tumors are the carcinomata. They are found much more frequently than the sarcomata. Malignant tumors of the thyroid invade the capsule so that it becomes adherent to the surrounding structures. The trachea and the oesophagus may be invaded and compressed. The carotid artery may be displaced and the carotid sheath may become adherent to the tumor mass. The walls of the veins are less resistant than the walls of the arteries to the invasion of the tumor, so that thrombosis often occurs. There may be pressure on the recurrent laryngeal, vagus and sympathetic nerves and the upper roots of the brachial plexus. Metastases may occur in any organ. In one case that I saw some years ago, at autopsy metastases from a carcinoma of the thyroid were found in the pituitary gland and in the lungs.

A malignant tumor of the thyroid should always be suspected when a goiter begins to enlarge quite rapidly and especially if it is painful and is adherent to the surrounding skin. Sometimes the pain is quite severe and may be referred to the shoulder because of pressure on the brachial plexus. Interference with deglutition and difficulty of breathing are caused by the pressure on the esophagus and trachea. The voice is hoarse and there may be aphonia. The veins of the neck may be greatly congested and oedema of the face and cyanosis may be present. The skin is reddened, and in rare cases may become ulcerated. If the sympathetic nerve in the neck is compressed, there may be a slight exophthalmos, miosis and loss of pupil reaction. In the late stages of the disease, ulceration into the trachea and esophagus with resulting hemorrhage may occur. The patient shows rapid emaciation and cachexia, and a remittent fever is not uncommon. Death occurs from exhaustion or from pneumonia.

Inflammation of the Thyroid Gland

(Thyroiditis or Strumitis)

An inflammatory condition of the thyroid gland may occur during the course of an acute disease, such as typhoid fever or influenza or it may be more chronic in character as the result of a tuberculous or syphilitic infection. In the acute cases the onset of the disease is sudden and is ushered in by chills and fever. There is intense pain in the neck and it is referred to the occiput, the ear or down the arm. A sense of constriction of the neck and difficulty in breathing is complained of in the majority of cases. Very soon the thyroid is swollen, hot and tender. The tenderness and pain in the gland is increased by swallowing or by movements of the head and neck. Sometimes there is an accompanying tracheitis with hoarseness and cough, and occasionally aphonia. In these cases alarming suffocative attacks may occur. If suppuration occurs, the skin over the gland becomes reddened. I saw one such case a year ago in a man forty-five years of age who had typhoid fever. He had always had a goiter and the right lobe of the thyroid contained a cystadenoma about the size of a hen's egg.. During the fourth week of the disease, this became painful and tender, increased considerably in size, and the skin became reddened. On the tenth day after the onset of the strumitis an incision was made and six ounces of pus evacuated. The inflammation quickly subsided and the patient made a good recovery.

A rare form of thyroiditis, which has been termed woody thyroiditis was first described in 1896 by Riedel. The gland is hard and firm, resembling a malignant tumor, and the most striking symptoms are pain and dyspnoea. Bacteriologically the cause of the condition has not been determined. It may cause all the symptoms and physical signs from pressure on the surrounding structures that have been described under colloid goiter. Though rare, it is important to remember that such a condition exists because it is not infrequently mistaken for malignant tumor.

SYMPOSIUM ON TUBERCULOSIS*

PHYSICAL SIGNS

W. J. Dobbie, M.D.
Weston

Introduction

THE procedure to be followed in making a physical examination is well known to every physician. Each physician also develops his own technique, and for each, his own, is probably the best. The main point to be emphasized in all cases, however is that each step in the examination (whether it be Inspection, Palpation, Percussion or Auscultation) should be thoroughly practised, because from each, one is likely to obtain some contribution that may be of value in the final summing up of the case. More failures to detect physical signs that are present, are due to lack of thoroughness in making the examination, than are due to lack of knowledge of the nature of the signs. This is particularly so in examining any case in which tuberculosis is suspected.

Preparation of Patient

The preparation of the patient for the examination deserves special attention. (1) It should be almost superfluous to say that the room should be suitably warm, well lighted, and as quiet as possible, and yet in many instances these points are entirely neglected. (2) The whole chest should be uncovered, both back and front for it cannot be emphasized too strongly that this is necessary for any thorough examination of the chest. (3) The clothes should be fastened securely but comfortably about the waist, so that the position assumed by the patient may be one of complete muscular relaxation. Care should be taken also to place the patient in such a position as will produce, to as great an extent as possible, an unrestrained pose of the two sides as regards at least position and muscular tension. In examining the back the shoulders should be drooped so that the scapulae may cover as little as may be of the thoracic wall.

It is important also that the examiner should be prepared to mark on the chest by abbreviated signs, as the examination proceeds, any abnormalities noted—so that it may not be necessary to trust to memory at the conclusion of the examination in recording on a chart the abnormal findings.

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*Presented before the Ontario Medical Association, 1921, by the Laennec Society.

In describing the application of the ordinary methods one does not presume to attempt an exhaustive dissertation on the signs that each may reveal, but merely to mention suggestively certain points which are of particular value.

INSPECTION

Inspection is a valuable method of examination, if it be not done too hurriedly. Inspection of course requires a good light. It reveals at once the shape of the thorax which is as a rule in early cases of tuberculosis without abnormality.

There should be included not only an *anterior and posterior view of the chest,* but also a *profile view.* A view from *above, downward,* obtained by the examiner standing behind the patient, and looking over the shoulders, is frequently of value. Of the more important signs to be sought may be mentioned:-

(1). *Any retraction*—such as the flattening of an apex, though of course this is not necessarily due to disease and in any case it is not a sign of early tuberculosis.
(2). Drooping of a shoulder—often found to be present on the affected side.
(3). Prominence of a clavicle or an exaggeration of a supraclavicular fossa.
(4). Muscular atrophy.
(5). Diminished expansion or lagging.

Other parts than the thorax should be viewed, viz. the pupils for unilateral dilation, the cheeks for flushing, the neck for an enlarged thyroid, the skin for evidence of loss of vasomotor tone. One notices also, as it were unconsciously, the constitution, the nutrition, the muscles, the subcutaneous fat, the color, the carriage of the body, the expression.

Inspection should include as well an examination of the larynx and the nasal passages, for the presence of any obstruction which may cause auscultatory changes in the chest, or for the presence of tuberculous involvement.

The triumvirate, *teeth, tonsils and turbinates,* have been found guilty in not a few instances of stirring up trouble in the chest, and they should, therefore, be thoroughly inspected. The inspection of the movements of the two is most important. It may, with advantage, be supplemented by *palpation,* as by combining touch and vision more accurate comparisons are likely to be made.

PALPATION

Palpation will detect of course enlarged cervical glands. These may or may not be tuberculous. It is also of value in detecting any lack of symmetry in the respiratory movement of the two sides. There may be:- (1) Lagging of one side—or of a part of one side—and apex or a base. (2) Limitation of expansion. (3) Interrupted or jerky movement. (4) Muscular spasm, described by Pottenger, may be looked for but is of doubtful value to the average examiner.

PERCUSSION

Percussion, which should as a rule be gentle, will when skillfully applied usually reveal some alteration wherever there is a diagnosable lesion. Corresponding points should be compared on the two sides of the chest. If any impairment is by this method found on one side, then the clear side should be percussed from base to apex to detect areas of relative impairment, not revealed when one side was compared with the other. Impairment at any of the so called sites of election, the apices of the lower lobes and the apices of the upper lobes, leads to investigation as to its extent, its depth, and as to whether or not impairment is present elsewhere.

Percussion should be performed before much deep breathing and *forced cough* is practised.

TOPOGRAPHICAL PERCUSSION

The careful mapping out of the apical resonance area of each lung is often of value. This has been called Kronig's isthmus.

The lower lung borders, also, at the end of inspiration and expiration should be compared, as well as the excursion on the two sides.

It should be kept in mind that between the percussion notes of the two apices there is normally a slight difference. One must not forget also that changes may be present, due to unequal *muscular development,* scoliosis, or other curvature of the spine; that in early cases, dulness may be absent or slight, or that the lung may be hyperresonant, due to emphysematous changes in an apex.

One should also percuss over the sternum, along the borders of the sternum, over the vertebrae, and along the vertebrae, to detect the presence of bronchial gland enlargement or other mediastinal involvement.

AUSCULTATION

Auscultation is of course never omitted. In fact it is often relied upon when evidence could be more accurately obtained by some of the other methods.

Any abnormality found on auscultation must be accounted for; either as a normal physiological difference between the two sides, or as an evidence of disease. If it is regarded as the latter it is important to note (1) whether it is heard over a wide area, or (2) is it localized and (3) if so where and (4) is it persistently localized.

The entire chest should first be ausculated superficially, for the purpose of determining the normal vesicular murmur, peculiar to the individual.

The patient should breathe orally, and noiselessly, maintaining as far as possible, the normal ratio between inspiration and expiration (Bray).

After quiet breathing one should have the patient breathe forcibly and slightly more rapidly. Finally one should have the patient's expiration followed by cough, and then by moderate inspiration, thus often eliciting rales not otherwise heard. It is advisable at this point to impress on the patient the necessity of covering the nose and mouth during forced expiration or when coughing.

During the examination, the patient should if possible breathe thoracically not abdominally.

The examiner should pay special attention
(1) To the supra-spinous fossae.
(2) To the supra-clavicular spaces.
(3) To the first and second inter-spaces.
(4) To the apices of the lower lobes.
(5) To areas in the high parts of the axilla.

In the study of breath sounds there are so many factors which may cause such marked variations, that it becomes difficult to distinguish physiological from pathological conditions. Thus the character of the apical murmur, may be altered, by the force and time interval of the respiratory act; broncho-vesicular breathing may be produced, or prolonged expiration accentuated at right apex, by deviation of the trachea, by the pressure of an enlarger thyroid, by scoliosis with convexity to right in the upper dorsal region, or by inproper nasal or oral breathing.

Therefore, while changes in relative length and intensity of inspiration and expiration, may be of value, they are often misleading, and except in an early acute case are not as important as is the presence of rales especially if heard in showers, localized and persistent.

Rales, extending continuously or even brokenly, from the apex downward, are very significant of tuberculosis (Heise). If heard on quiet respiration the disease is no longer incipient.

The rales of tuberculosis must not be confused with inconstant apical rales, occasionally heard at the end of inspiration, with sterno-clavicular crackle (diagnosed by having patient hold breath and rotate shoulder) or with sternal and muscular sounds, or with crackles heard along the basal margins.

The examiner should remember that other non-tuberculous conditions, such as catarrh following influenza, bronchiectasis, pulmonary oedema in mitral stenosis, or arterial hypertension, may also give rise to rales.

SINGLE PHASE AUSCULTATION

In listening to the breath sounds what is known as single phase auscultation is an excellent method. In this inspiration and expiration are separately compared on the two sides of the chest.

The degree of importance of each of the usual methods of examination is clearly demonstrable by an analysis of the requirements under "Physical Signs" as laid down by the National Tuberculosis Association of the United States in classifying cases of tuberculosis as "Incipient" or "Moderately advanced."

Incipient (or Minimal) cases are described as having "Slight Infiltration limited to the apex of one or both lungs or a small part of one lobe" and these terms have been defined as follows:-

Slight Infiltration

	PHYSICAL SIGNS OF	DETECTED BY
(1)	Slight prominence of the clavicle	Inspection
(2)	Lessened movement of the chest	Inspection
(3)	Lessened Movement of the base	Inspection
(4)	Narrowing of apical resonance	Percussion
(5)	Slight or no change in resonance	Percussion
(6)	Distant or loud or harsh breathing	Auscultation
(7)	With or without some change in rhythm (prolonged expiration)	Auscultation
(8)	Vocal resonance possibly slightly increased	Auscultation
(9)	Fine or moderately coarse rales present or absent	Auscultation

Apex—that portion of the lung situated above the clavicle and the 3rd. vertebral spine.

A small portion of one lobe—an area of one or two intercostal spaces of an area of 60 to 80 sq. cm. in extent according to the size of the patient.

Moderately Advanced

"Localized consolidation, moderate in extent with little or no evidence of cavity formation; or infiltration more extensive than under minimal" and these terms have been defined as

Moderate Extent of Localized Consolidation

		DETECTED BY
(1)	An area of ½ lobe or less but may involve both apices	Percussion
(2)	Marked dulness	Percussion
(3)	Bronchial or decidedly bronco-vesicular breathing	Auscultation
(4)	Markedly increased vocal resonance	Auscultation
(5)	Rales usually present	Auscultation

In conclusion it should be said (1) that when one does not discover physical signs it is wise, when the history and constitutional signs are suspicious, not to conclude that there is no lesion present, but merely that one has failed to locate it. (2) It may be possible to determine definitely the presence or absence of clinical tuberculosis from a single physical examination. (3) The importance of physical examination in diagnosis of pulmonary tuberculosis has been over emphasized (Brown). (4) Symptoms are a better and more accurate guide to activity, than physical signs. (5) The disease is practically always more extensive than indicated by physical signs. (6) Apical conditions should be considered tuberculous until proven not to be; basal conditions, as non-tuberculous, until proven to be tuberculous.

Above all one should not rely on physical signs alone for diagnosis of tuberculosis. All the information to be had by the use of all the different methods is required. If an error of this kind is made it will be true as Pottenger has well said (I.427) "The physician who is not expert in examining chests must not make his diagnosis depend upon auscultation or upon any other single method of examination. If he does he will diagnose only late tuberculosis."

Quantitative Bacteriology of Tonsils—An attempt was made by H. D. Caylor and George F. Dick, Chicago, to investigate the significance of the actual number of bacteria present in the interior of the tonsillar tissue as an index to the degree of pathologic change in the tonsil, and to determine whether or not tonsils with large numbers of bacteria per unit weight were more commonly associated with disease in other parts of the body than were those containing comparatively few bacteria. The tonsils from patients who complained of recurring sore throat, or who had at the time of operation enlarged cervical glands, contained from two to twenty times as many bacteria per gram as did the tonsils from patients who did not complain of sore throat or have enlarged cervical glands. There is no apparent relation between the number of bacteria per gram of tonsil tissue and the types of organisms found predominating on the plates. Nor is there any apparent relation between the types of bacteria and the clinical condition of the patients or pathologic condition of the tonsils. The tonsils which showed the highest bacterial content per unit weight were the relatively small tonsils in which chronic fibrous inflammatory changes had occurred. It was this type of tonsil which was associated with disease in other parts of the body. Large, spongy tonsils, rich in lymphoid tissue, usually contained a smaller number of bacteria per gram, and were less frequently accompanied by disease elsewhere than in the throat and cervical lymph glands. The results of this work indicate that tonsils should not be regarded as harmless because they are small. —Jour. A. M. A., Feb. 25, 1922.

Case Reports

NOTES ON TWO CASES OF RHEUMATOID ARTHRITIS

A. Mackenzie Forbes, M.D., Montreal

Orthopedic Surgeon, Montreal General Hospital

Case 1.—Mrs. M. L.—M. G. H.—No. 5659—1921,—aged 56 years, was admitted into the hospital on account of attacks of sciatica recurring at intervals since the age of twenty. For the past five years she has suffered from intermittent swelling of various joints. It was stated that these swellings have appeared only to disappear and appear again in some other joint. For the past four years she has had but little movement in her thighs; she has been unable to flex them, and in mounting a stair she has had to go up backwards. One week ago she found that she was unable to assume the sitting posture: since that time she has remained in bed.

Examination shows the patient to be a fairly well nourished woman although she complains she has lost considerably in weight during the past few years. Her temperature is normal and her pulse 92. She can move quite comfortably in bed, although the thighs and knees remain in a position of flexion.

The left hip is held in a position of 35° flexion with no eversion but a definite adduction. The right hip is held in a position of 45° flexion with no eversion, but some adduction. There is fixation of both hips, but no ankylosis: this fixation is greater on the left side than on the right. The adduction of the hips is so great that the knees cannot be separated for more than $4\frac{1}{2}$ inches. The measurement of the right thigh is $16\frac{3}{4}$ inches; of the left $16\frac{1}{4}$ inches. When the patient stands it is noticed that her spine assumes a position of marked lumbar lordosis which compensates for the flexion of the hips, otherwise the spine is quite normal. There is pseudo crepitus in both shoulders and both knees. The glands in the right groin are not palpable, but those in the left are palpable. A diagnosis of rheumatoid arthritis was made, and a search for a primary focus was carried out. A thorough dental examination was first made, and no focus of infection was found in the gums. She had been wearing artificial teeth for the past two years. After a careful medical examination Dr. Gordon reported that the patient was suffering from a moderate degree of anaemia: but that no local source of infection could be found. The gynaecologist also reported that apart from a slight vaginal discharge, a senile vaginitis, there was no evidence of any focus of disease.

At the laryngological department it was reported that both tonsils were submerged and cryptic with definite areas of injection over the anterior pillars: but the left tonsil was probably a definite infecting focus. The nose, ears and naso-pharynx showed no evidence of disease.

An X-ray examination revealed marked roughening of the acetabular margins. Below and internal to the neck of the femur fairly large, dense shadows were noted which suggested calcarious deposits.

The tonsils were, therefore, promptly excised. Cultures made from them showed streptococci in pure culture. When the patient had recovered from this operation a course of dry heat applications was made to the hips, followed bv massage and manipulations; a restricted diet was ordered, and a mild course of magnesium sulphate and iodine was commenced. In six weeks' time the patient was greatly improved and discharged to her home where she could continue treatment.

Case 2.—Miss A. A.—No. 5835—1921, M. G. H.,—age 38 years, was admitted into the service of Dr. Lafleur on December 17th, 1921, complaining of pain across the back and occasional aches in both knees and hip joints. She was referred to this department three days later.

Examination revealed the right hip held in 45° flexion and in adduction. There was no eversion. There was also flexion and adduction of the left hip. Measurements of the right thigh and the left thigh were equal. The glands in both groins were hardly palpable. The spine showed restriction of lateroversion to the left and markedly restricted extension. There was pseudo-crepitus in both shoulders and knees.

A *diagnosis* of hypertrophic rheumatoid disease was made and the elimination of all foci of infection was recommended, a special note being made that no attempt to relieve deformities should be made until the disease was quiescent.

As in the first case the patient was referred to the medical, the dental, the laryngological and the gynaecological departments for examination. From all of them a negative report was received as to the presence of any foci of infection discoverable. Following out the suggestion of Dr. Pemberton some years ago that in many of these cases a decreased sugar tolerance appeared to be the cause of the arthritic symptoms, a biochemical examination was made, and the report was received that there was definite evidence of diminished sugar tolerance. Because of this decreased sugar tolerance and because no other source of infection had been found the patient was placed on a dietary with almost complete restriction of the intake of sugar and carbohydrates. An improvement in her symptoms took place, but, unfortunately the dietary had soon to be discontinued and the amount of proteid she was taking decreased, on account of the appearance of albumen and casts both granular and hyaline in her urine. The return to a more normal diet was followed by the disappearance of albumen and casts in the urinary findings.

ULCERATIVE COLITIS DUE TO BACILLUS DYSENTERIAE, SIMULATING PERNICIOUS ANÆMIA

No. 697.—1921—Mrs. M.,—age 40:—was admitted to the Montreal General Hospital complaining of diarrhoea, shortness of breath, nervousness and weakness.

Past History. She was born in Canada and has always lived here except for six years' residence in the New England States. She had rheumatic fever at the age of 7, and at 19 a large cystic ovarian tumour was removed.

Present Illness. In February 1917 she was treated in this hospital for secondary anaemia. Her symptoms dated back to 1912, but she gave no history of haemorrhages. During the two months that she remained in hospital, epistaxis and menorrhagia were noted. She had no diarrhoea. At that time no focus of infection could be established, although both the appendix and the nasopharynx were under suspicion. Three examinations of the stools showed on no occasion the presence of blood or of parasitic ova. The blood examination showed the following:—R.B.C. 3,000,000 W.B.C. 7,600: Haemoglobin 21%. The secondary type of anaemia was shown by smears. Following a convalescence of three months she remained in moderately good health until September 1918 when a severe haemorrhage, subsequent to an abortion, precipitated symptoms of marked anaemia. She remained in bed for two months at this time. In December 1918 she had a severe attack of diarrhoea which she attributed to the drinking of contaminated water. A local epidemic was prevalent. Since then, diarrhoea has been her most obstinate symptom, responding poorly to treatment. She returned to this hospital in March 1919. She had lost considerable weight. Her temperature varied from 98° to 100.8°. The spleen was enlarged. There was marked abdominal pain and diarrhoea and severe oedema of the feet and ankles. The blood showed:—R.B.C. 2,510,000; W.B.C. 6,400. Haemoglobin 10% (Daré). The smears were of the secondary type. From that time she received treatment in various places and different diagnoses were made in each place. She returned to us on December 4th, 1920.

Examination. Profoundly anaemic and of waxy complexion. Hair prematurely white. Some carious teeth and roots. The heart is not enlarged and a soft systolic murmur is heard at the apex and over the area of the pulmonary valve. The liver and spleen are both enlarged. A small sausage-shaped mass, transversely placed, was palpable to the left of the umbilicus. There was oedema of both legs; the left leg especially was extremely oedematous and presented numerous varices.

Diary and Special Findings. Occult blood and pus were repeatedly found in the stools. Occasionally the blood was visible. Urinalysis was negative. Blood findings:—R.B.C. 1,100,000. W. B.C. 4,600. Haemoglobin 10% (Daré). Differential—Polymorphs 45%, Large Mononuclears 6%, Small Mononuclears 16%, Transitional 34%, Eosinophiles 2%. Poikilocytosis, anisocytosis, normoblasts. The blood Wassermann re-action was negative. X-Rays following barium enema and barium meal gave no positive information. There was a persistent low grade fever.

Repeated blood transfusions were given at intervals of seven to fourteen days. Each was followed by very noticeable improvement in the blood picture and of the patient generally.

On January 5th, 1921 a proctoscope was passed. The mucous membrane of the rectum and sigmoid was covered with mucous and there was diffuse ulceration. The ulcers bled very easily

Some of the material was sent to the laboratory for examination. A culture of B. Coli was isolated. No tumour tissue was found.

On January 15th, Flexner's type of B. Dysenteriae was isolated from the stools. Accordingly, after a month's trial by treatment with emetine hydrochloride and anti-dysenteric serum, an ileostomy was performed, bringing a loop of ileum, 12.5 c.m. proximal to the caecum, out through the abdominal wall and completely dividing it, thus giving absolute rest to the colon. At this operation the appendix was removed. It proved to be the seat of chronic inflammation.

The postoperative treatment consisted of daily colonic irrigations of normal salt solution and silver nitrate .1-10,000. for a period of four weeks. Following this, three fluid ounces of liquid paraffin were instilled into the colon daily, and once a week the colon was washed out with salt solution. All irrigations were introduced through the distal limb of the ileostomy loop. The pus gradually diminished in the washings. She gained weight and strength, and her colour progressively improved.

By May 3rd the proctoscope showed á material decrease in the amount of mucus. The mucous membrane was very much less congested, and the ulcers were neither so deep nor so numerous. On September 1st only one small ulcer was visible: the rest of the mucous membrane was healthy.

The ileostomy was closed in two stages, the final repair being done on September 29th, 1921. Since then she has been free from diarrhoea and has been gaining weight steadily. On October 13th the blood findings were:—R.B.C. 4,150,000: W.B.C. 6,600: Haemoglobin 45-50%. No poikilocytosis or normoblasts. Slight anisocytosis and variation in staining qualities.

Discussion. This case presented a difficult problem in diagnosis. It was by no means easy to differentiate the type of anaemia that was present. In many ways the clinical manifestations resembled pernicious anaemia. The persistence of a moderate temperature was a strong point in favour of this condition. On the other hand, the loss of weight, the lack of characteristic apathy and "lemon tint," and more especially the blood picture were not in accord with this type of anaemia. The possibility of an intra-abdominal neoplasm was suggested by the loss of weight, the persistent diarrhoea and the presence of blood in the stools. The cramp-like abdominal pains and an imperfectly palpable peristalsis increased this possibility. Against this, were the X-Ray findings.

It was not until the results of the proctoscopic examination were known that importance was placed on the history concerning the local epidemic of diarrhoea. The stools were then carefully examined for amoebae. None were found. A second specimen was examined and Flexner's type of B. dysenteriae was isolated.

The notable features in this case were:—

(1) The difficulty of diagnosis due, in part, to the antecedent anaemia.

(2) The advantage of team work in a general hospital which can often accomplish a diagnosis in such obscure cases. The case reported illustrates the result of co-operation in four different departments.

Note.—Report from patient April 6. Has been doing her own housework throughout the winter and enjoys good health except for slight oedema of ankles and some pallor.

H. M. Young M.D., *Asst. Supt.*

From Services of Drs. A. H. Gordon, C. K. P. Henry and A. T. Bazin.

INTERMITTENT HYDRONEPHROSIS DUE TO KINKING OF THE RIGHT URETER BY AN ACCESSORY RENAL ARTERY

Hospital No. 146.—1922.—This patient, a male 33 years of age, was admitted to the Montreal General Hospital into the Urological service complaining of "Pain in the right side." He had had bronchitis nine years before and tuberculosis of the lungs for one year. For the past five years he had been a morphine *habitué*, having started to take this drug on account of "Rheumatic pains in the back." The present illness began suddenly with pain in the right anterior abdomen, though for the past five months he had had pain in the back, on both sides. The abdominal pain, which was of a stabbing character, was localized just above McBurneys point, did not radiate, and was so severe that it caused the patient to move from side to side. He vomited twice on the fourth day and seven times on the fifth day after the onset of illness. There was no frequency of urination. He had never noticed anything abnormal about his urine.

On examination pain was complained of on the right side of the abdomen on coughing; tenderness and pain over the right ureter on deep palpation over McBurneys point, and marked pain in the right costo-vertebral angle. The kidneys were not palpable. On rectal examination there was slight tenderness high up on the right side. Examination of the common urine showed blood. Both ureters were catheterized with ease but the examination of the urines obtained was not very enlightening.

Pyelographic examination showed a definite kinking of the right ureter and slight hydronephrosis of the right kidney.

Examination of the chest showed quiescent tuberculosis of the left lung.

At operation, on the ninth day after admission, a medium sized pulsating accessory artery was found to run behind the right ureter and into the lower pole of the right kidney. The ureter over this accessory renal artery was definitely compressed and kinked and the ureter above the artery and the kidney pelvis were dilated. This artery was doubly ligated and severed between ligatures. The abdominal pain disappeared but the pulmonary tuberculosis became active and led to the patient's death two months after admission.

At autopsy the kidneys were about of equal size and normal weight. Each kidney had an accessory artery which arose independently from the aorta between the inferior mesenteric artery and the bifurcation of the aorta, passed behind the ureter and entered the lower pole of each organ.

Right Kidney. The accessory artery to the lower pole of the right kidney was severed. Its distal portion was obliterated. The proximal portion showed at its tip a definite constriction (site of ligature) proximal to which the vessel was obliterated for 1 cm. The remainder of the lumen of the vessel was patent. The capsule of kidney stripped easily, leaving a smooth surface, except at the lower pole where the accessory artery entered the kidney. There was at this point a retracted, pale, wedge-shaped, infarcted area 4 x 5 cms. which extended into the kidney substance for 1 cm.

Left Kidney. There was no evidence that the accessory artery to the lower pole of this organ had led to constriction of the ureter. There was a second small accessory artery, a branch of the supra-renal which entered the kidney at a point mid way between the upper pole and middle portion of this organ. This artery was accompanied by a small vein which emptied into the main renal vein. The capsule stripped easily leaving a smooth surface except at a point on the convex surface mid way between the middle of the kidney and its upper pole, where there was a roughly circular area about 2 cms in diameter, which was studded with small tubercles. This tuberculous area extended well into the medulla and at one point involved a calyx.

Microscopical Examination. A section through the infarcted area in the right kidney showed anaemic necrosis with beginning organization.

Summary. A patient, 33 years of age, was admitted to the Hospital complaining of pain in the right side. The pain was found to be due to an accessory renal artery which passed behind the right ureter, leading to compression and kinking of this organ and to an accompanying intermittent hydronephrosis. The condition was completely relieved by operation. The opposite kidney showed an accessory artery in the same anatomical position, but it had not led to compression of the ureter. The patient died of tuberculosis of the lungs which became active after operation. The case illustrates forcibly the value of pyelographic examination in renal diagnosis.

W. W. Beatty, B.A., M.D.

Pathological Laboratory, Montreal General Hospital.

PURPURA HAEMORRHAGICA COMPLICATED BY GANGRENE OF THE GLANS PENIS AND LUNG ABSCESS

W. B.—Hospital No. 295—1922.—age 56 years, was admitted to the Montreal General Hospital, on January 16th, 1922, complaining of pain and swelling of hands and feet, inability to breathe through the nose, headache, discolouration of the skin and shortness of breath.

His present illness began suddenly on January 10th, 1922, six days before admission to the hospital, with severe pain in the knees, associated with swelling of the legs which made any attempts at walking painful and difficult, and on the following day confined him to bed. On January 12th he noted for the first time brownish spots on his legs. On January 13th the urine was definitely blood tinged, and there developed soreness in the penis. On January 16th, both arms and hands became swollen and the skin covering them showed a discolouration similar to that on his legs. The patient coughed a good deal. On admission to the hospital, six days after the onset of illness, the temperature was 100.6°, pulse 98, and respirations 24 to the minute. The red corpuscles, 4,200,000; white corpuscles, 12,000 to the cubic millimeter, and haemoglobin 80%. There was nothing abnormal in the blood cells. The physical examination showed a purpuric eruption on the arms, legs and trunk, with oedema of the arms and legs. An acute congestion of the mucous membrane of the pharynx and tonsil was noted; the nasal passages were plugged with blood clot and a few rales were heard at the bases of both lungs. The fore-skin, which could not be retracted, was reddened and oedematous and a sero-haemorrhagic discharge could be expressed from beneath it. Urinalysis was normal: Wassermann re-action negative, and the blood culture was sterile. A diagnosis of purpura haemorrhage was made. For three days after admission the condition of the penis did not change, but on the third day a blackened gangrenous area appeared on the dorsum of the penis and rapidly extended until the skin on this surface of the organ was involved from the prepuce to within one inch of the base. Under local anaesthesia, a dorsal slit was made exposing the glans penis which was also black and gangrenous. Numerous incisions were made through the gangrenous and oedematous skin of the penis and into the glans itself. Moist dressings of hot boracic solutions were applied continuously. At no time was there any difficulty in voiding. Smears and cultures taken at the time of operation showed many streptococci with a few fusiform bacilli and spirochaetes. Cultures and smears from the tonsils showed the same organisms. A line of demarcation gradually appeared at the margin of the gangrenous area on the penis with eventual sloughing of all of the glans and the involved area of the skin. Subsequent convalescence of the patient was prolonged by the development of a lung abscess from which he is rapidly recovering. The lesion of his penis is healing.

Remarks. The sequence of events appears to be that an area of purpura haemorrhagica involving the penis became infected with streptococci and fusiform bacilli and spirochaetes probably from the mouth conveyed by the fingers, which led to rapid gangrene. Other cases of rapid gangrene of the penis have been noted, the bacteriology of which was similar to the case reported. The inability to retract the foreskin was due to a congenital phimosis which, with the haemorrhage and oedema associated with the purpura, mechanically prevented drainage of the preputial space and predisposed to infection: an important factor in the production of gangrene of this type.

H. C. Cassidy, B.A., M.D.,
Senior House Officer, Urological Service Dr. F. S. Patch.

SUPPURATIVE PAROTITIS

F. H. Age 45, Farmer.—January 21, 1921.—suffering from duodenal ulcer. January 25, complained of recent swelling in right parotid region causing difficulty in opening the mouth. A tender swelling over right parotid region. Temperature 97.3—Pulse 70.

February 4, swelling of right parotid almost disappeared, tenderness very slight, a little distress on opening mouth. February 7, swelling of right parotid larger and more painful, quite hard above angle of jaw, below mastoid process, and in front of ear; also some redness of the skin; Steno's Duct not palpable although orifice slightly reddened: gland not movable. Temperature 99—Pulse 68.

Advised frequent brushing of teeth and application of heat.

February 9, gland more swollen and quite painful. Quite hard in front of ear, below angle of jaw and extending to mastoid, with some redness over this area, and pus exuding from Steno's Duct.

Pressure over gland causes small beads of thick pus to exude from the duct. Temperature 99.1—Pulse 84.

Treatment.—Gentle massage along course of Steno's Duct: Morphine grs. ¼: Pulv. Ipecac. Co. grs X q. 4.h. Mouth wash q.3.H.

Condition completely cleared up in another fortnight without surgical interference.

G. W Aitken, London

SYPHILITIC AORTITIS AND ENDOCARDITIS

Mr. A. T., age 48.—negative history for Tuberculosis complains of dyspnoea and pain in the chest and back. Nightly has attacks of paroxysmal dyspnoea and angina pectoris.

Examination of precordium shows heart markedly enlarged in all directions—Churning murmurs heard in all areas.

B. P. Syst. 150—Diastolic 0.

X-Ray shows markedly enlarged heart but no aneurysm. Wassermann XXXX. Wife has had several miscarriages and has lost cartilage of nasal septum. Treatment—Part time rest. Daily mercurial Inunctions. K. I. grs X. Q. I. D. with much improvement after three weeks treatment, but still has attacks of angina at night. It is proposed to inaugurate Salvarsan treatment later on. J. C. LINDSAY

DIAGNOSIS UNCERTAIN HELP WANTED

Child, age 7.—No history of previous illness.—Two months ago right eye inflamed. Gradually there appeared a slight bulging of the eye above the Iris muscle—thinning of corneal surface and opacity of vitreous humour apparent. Sight unaffected—in fact better in damaged eye than opposite eye. Section of swelling removed and pathological report was negative for melanotic sarcoma or malignancy of any kind. No history of accident. No Wasserman taken—no apparent foci of infection. What is the cause and explanation of this case? J. I. FERGUSON,

Harvey Club, London.

Retrospect

ORTHOPAEDICS

In a recent address delivered before the Iowa State Medical Society (Jour. Iowa State Medical Society, December 1921) on the Standardization of Methods of Treatment in Orthopaedic Surgery and in Industrial Surgery of the Extremities and Spinal Column, Dr. Robert B. Osgood of Boston presents a very interesting statement of modern views in this important department of surgery. An abstract of his address is herewith attempted.

Tuberculous joints. In tuberculous joints of childhood rest and fixation without operation constitute the standard treatment. A tuberculous knee in an adult should be excised. Hip disease in children may demand, according to the social condition of the patient and the amount of attention he is likely to receive, either fixation alone (usually by plaster spica), or in combination with traction, as in Dr. Bradford's traction abduction brace. Fixation alone, with painless weight-bearing allowed, is apt to give an ankylosed hip, while Dr. Bradford claims free movement follows the use of his brace. Pott's disease in children shows as good results when treated on the Bradford frame as by any other form of treatment. In adults grafts of boiled beef-bone advocated by Gallie are recommended in preference to homogenous grafts.

Rickets. Before deciding as to braces or operation we must be able to answer two questions (1) Is the nutritional disease quiescent? (2) Is the deformity increasing or progressing? If the underlying disease is controlled even surprisingly bad cases of rickety deformity correct themselves, while all light cases do so. Bloodless osteoclasis is to be preferred to open osteotomy in general, as safer. The so-called epiphyseal separation of the hip in adolescent rickets, if there be such a disease, may usually be greatly improved or often completely corrected by manipulation under ether and fixation in full abduction.

Scoliosis. There is no standard method here, nor are we able in many cases to secure anything like complete correction or even to prevent the development of deformity under our very eyes by any method of treatment, exaggerated and hopeful claims to the contrary. We seem to arrest or even correct many slight early cases by exercise, by light corrective braces, perhaps by forcible plaster jackets, but perchance the underlying bone disease corrects itself and nature does in reality what we seem to do. In severe progressive curvature it would seem rational to impose recumbency plus medication, plus hyperaemic physiology, plus corrective appliances, but let us first remove the force of deforming gravity, always at work in the erect position.

Congenital Deformities. Lorenz's claim of 80-90 per cent of anatomically perfect reductions in congenital hip dislocation is probably too high. Reduction by open operation has left too many stiff joints in its train, unless we find that Galloway's recently reported large percentage of successes can be duplicated by other surgeons. Bloodless reduction is still the method of choice, and the reposition is comparatively easy up to four years. Congenital club foot should be treated as soon as discovered, at first by daily manipulation and adhesive plaster or soft dressing retention, with plaster-of-Paris dressing in later childhood. In resistant cases of over four years Ober's operation is usually successful and non-mutilating; the bone operations in general are not standard methods of treatment in childhood.

Poliomyelitis. Prevention of deformity during the first six to twelve months is the only surgical treatment. Tenotomies and tendon transfers are our next procedure. Muscle training aided by operative stabilization come later, together with ambulation assisted by the least possible brace support.

Foot strain and faulty weight bearing. Here we must recognize that strained feet are almost always induced by imperfect and inadequate muscle action. The main ligament which prevents the arch from falling is the calcaneoscaphoid. Pronation of the foot, the precursor of joint strain and flat foot, occurs at the calcaneo-astragaloid joint, not at the mediotarsal joint, as the text books say. The sustentaculum tali must be propped up. Badly strained structures must be given rest, whether by Thomas heels, adhesive plaster strapping, or by supporting and correcting foot plates, but if a cure is to be permanent we must permanently restore normal balance to the muscles, by correcting faulty body posture, teaching proper methods of walking, exercising the adductor muscles at the expense of the abductors. Restoration of normal balance is the standard treatment. In anterior arch troubles and painful callous the problem is the same, first, lift the patient off the painful metatarsal heads and mould the arch back by lateral pressure and supporting pads or plates, then teach the patient to lift his own metatarsal heads off the ground by the development of the long flexors of the toes and the intrinsic muscles of the foot. Rigid feet must be usually dealt with by manipulation or open operation, and are rarely completely relieved.

Osteomyelitis. One of the direct results of the war has been the standardization of the treatment of infected bone. The principle is disinfection. Dakin's solution and Carrel's technique have in the writer's opinion shown the best results. Infected bone must be removed, no *craters* with overhanging edges should be left. When practically sterile these craters may be closed by muscle or skin flaps. Curetting the bone is no longer standard treatment. Acute osteomyelitis means early recognition and early complete drainage.

Joint Infections. Willems has apparently demonstrated that early voluntary joint motion, even in the presence of open wounds, provides the most adequate drainage and preserves the greater amount of function in septic joints. Most joint infections, short of frank pus, may be overcome by flushing out by normal saline or weak bichloride for ten minutes, following which the synovial cavity is closed tightly, and will rarely need reopening. If frankly purulent we must drain, and drain thoroughly. In spite of favourable results our experience with excision of septic joints does not lead us to believe that drainage is usually greatly bettered by the procedure. The end results are certainly distressing in many instances. In clean operations for internal derangements early voluntary movement will become standard treatment. We have passed the day when moderate effusion should contra-indicate this movement, provided the cause of the original effusion has been removed and the joint be protected from dangerous extremes and sudden strains.

Amputations. The functional end-result of a properly performed Syme amputation is to be lauded. Sites for amputation should be chosen with prosthesis always in mind. Painful nerve bulbs should be prevented by careful shortening of the nerve trunks after injection with 90 per cent alcohol. Proliferative bone changes in the stumps should be prevented as far as possible by the removal of cuffs of periosteum and endosteum proximal to point of section in clean cases. Traction should be applied to the skin above the flaps on the operating table and should be maintained until cicatrization has taken place. In leg amputations a provisional prosthesis, usually a plaster pylon, should be provided as soon as the wounds are closed, sometimes for infected stumps even in the presence of granulating surfaces. The mental effect is enormous and the hardening is hastened. Six months' time may often be gained. Wheel chairs become too comfortable.

Sprains. (1) Be sure no fracture exists. If one is found we must prevent callus formation by more complete immobilization. (2) Determine the exact anatomy of the lesion by ascertaining the method of its production and its mechanical necessities. (3) Protect the torn ligaments, usually by adhesive plaster, and allow immediate function, which provides massage.

Dislocations. The standard of treatment is complete reduction and incomplete fixation. At the earliest possible moment, surely within a week, slight voluntary movement by the patient should be encouraged at least once a day. Immobilization is far too often prolonged.

Fractures of the Spine. If there are definite symptoms of cord pressure less than those of complete severance, and the X-rays show probable pressure from bony fragments, operation should be undertaken at the earliest moment the condition of the patient will allow. When the arguments for and against operative procedures are nearly even, we should incline to nonoperative treatment. Fractures of the spine with slight or absent cord pressure symptoms are of great importance. The X-ray alone confirms our diagnosis. It is quite possible that the standard treatment will come to be early ankylosing operations on the spine by means of bone grafts or other fixative operative procedure. The time of prudent immobilization by apparatus may probably thereby be shortened, and full wage earning capacity hastened. If recumbent immobilization can be instituted very early these cases may be expected to fully recover without operation, but we must maintain this protective immobilization for perhaps six months if we are to avoid the subsequent irritative bony overgrowth changes (Verneuil's disease), which frequently cause increasing cord and nerve root pressure symptoms long after the original lesion is relieved. Transverse myelitis has been known to occur years after the fracture, from this slowly occurring hypertrophic bone change. Fractures of unimportant spinal elements, e.g. transverse and spinous processes, are frequently considered more serious than their immediate or remote symptoms justify and are likely to receive too heavy compensation.

Fracture of Clavicle. In adults it is difficult if not impossible to maintain good alignment by any of the classical methods, Velpeau bandage, Sayre strapping, etc. The shoulder will not stay back and up. Fortunately little lack of function may be expected even if a considerable degree of deformity results. A better and simpler method of obtaining alignment is to put the patient to bed with a pillow between the shoulders, the affected shoulder dropped back and held up. Fair to good alignment may be obtained by the old fashioned clavicular cross of wood or plaster. The cross bar is made wide enough to prevent the figure-of-eight bandage turns, which pass over and pull back and up both shoulders, from cutting into the axilla.

Fractures of the Shoulder Joint. Comminution plus dislocation of humeral head means open operation. In comminution alone there is a tendency to excise one or all of the fragments. We believe this tendency is wrong, even if good apposition of fragments cannot be obtained. Excised shoulders are usually extremely handicapped ones, and voluntary abduction is usually impossible. Surprisingly good function results from these severe comminutions, impossible to accurately replace without open operation, if abduction be maintained and prolonged immobilization avoided. Danger of ankylosis is a real one, but if the arm be fixed in 70° abduction in neutral position, i.e. halfway between the mesial and horizontal planes of the body and slightly rotated outward, a stiff shoulder is extremely useful and vastly better than an excised one. In fractures of the humerus below the greater tuberosity the muscle balance indicates fixing the arm in abduction as a rule.

Shaft of the humerus. The internal angular splint, even with coaptation, is imperfect mechanically. The Jones humerus traction splint is recommended.

Fractures of elbow joint. Standard treatment is reduction followed by fixation in acute flexion, except in olecranon fractures. Jones' dictum is to be followed: "Allow during convalescence gradual dropping of the forearm, provided always the patient can voluntarily return the elbow to the original acutely flexed position."

Both bones of forearm. Hard fractures to hold and if non-union results yield the poorer results from bone grafting. They may be best reduced by traction and moulding, and the alignment best maintained by fixation in a plaster running well above elbow and below wrist, the forearm fully supinated. By this method the bones are held well apart, and the danger of synostosis is least.

Colles Fracture. Importance is emphasized of breaking up impaction and reestablishing the normal difference in levels of the styloid processes. Most Colles fractures are not simply impactions but rotations of the lower radial fragment as well, and this rotation is frequently not maintained by the usual side splints plus ulnar deviation of the hand. Cotton and Loder, (Boston Med. and Surg. Journal, Dec. 4, 1919), treat by initial fixation in plaster in palmar flexion, the hand in extreme ulnar deviation and rotated into pronation, and this treatment is to be recommended. We realize that this is the worst possible position for eventual function, but as soon as consolidation has begun this position may be gradually changed with little danger of slipping.

Carpal fractures. Reduction of semilunar should be attempted, to be followed by excision as a last resort. Scaphoid fractures rarely unite unless immediately recognized and fixed. If non-union occur remove one of the fragments, usually the smaller. A more useful but not a perfect result may be expected. In doubtful cases have X-rays of both wrists taken, as a divided scaphoid is a common abnormality.

Fractures of pelvis. Standard treatment is recumbency and tight swathes, sometimes plaster spicas.

Fractures of hip joint. Intracapsular impacted fractures in elderly people are best left alone. In young and healthy individuals break up impaction and put in the standard position for union, full abduction and slight inward rotation. This may be accomplished by Whitman's long plaster spica, Bradford's abduction splint, double Thomas splints, Jones abduction frames or Balkan frames. The results of the Maxwell Ruth treatment by longitudinal, in combination with lateral, traction without splints are good.

Fractures of upper two-thirds of femur. Here traction is standardized, and if intelligently applied and actually maintained there is scant need of bone plates or open operation. We believe the Thomas leg splint will become the standard of treatment.

Fractures of lower third femur. Direct traction on femoral condyles by ice tongs is recommended. Pain is at the minimum, less weight is required and the knee can be kept exercised.

Knee joint fractures. T-fractures should be brought in close apposition by Scudder's temporary clamps or Lambotte's long fine screws, and voluntary movement should be early.

Fractures of patella. Operative retention is the standard, and we have yet to decide whether immediate suturing or suturing after a few days yields the best results.

Fracture of both bones of the lower leg. Often traction here is as important as in the case of the femur. Use the Sinclair skate or the glued sock, or direct bone traction on os calcis or malleoli.

Fractures of the tibia. If fibula be intact traction is of less importance, but in the lower third and in spiral fractures displacement is often obstinate. In fractures of the lower third the common displacement backward makes it impossible to put the foot up at the desirable right angle and sometimes it is wise to tenotomize the tendo Achilles.

Pott's Fracture. Functionally poor results are due to the fact that most surgeons fail to recognize two facts, (1) that the fracture is produced by abduction of the foot and (2) that the joint between tibia and fibula is often spread and the foot displaced backward. The standard treatment of reduction is therefore, first to pull the foot forward and second to adduct it, retaining the correction by a plaster cast.

Fractures of astragalus and os calcis. Treatment is hard to standardize. If the calcaneo-astragaloid articulation is gone the important lateral play of the foot is wholly or partially lost If limited motion persist here the result is often a painful foot. Astragalectomy may be justified but is less completely successful in adults than in children.

Compound fractures. The essential (Lemaitre and Duval) is getting at the cleaning process, or "débridement", as it has come to be called, within as few hours as possible, not more than fourteen, and following a meticulous technique of dissection of devitalized tissue in which bacteria always develop. If the cultures taken before this operation show gas bacillus and streptococcus haemolyticus the wounds are not closed immediately, but otherwise this rule has come to be absolute in all early cases. It should be the standard treatment of compound fractures in peace, and it must be a rare occasion when attention cannot be given the case within the first few hours. If there be danger of joints becoming ankylosed let us be sure that the position of ankylosis is that of greatest function—a shoulder in 70-80° abduction, the upper arm halfway between the mesial and horizontal planes in slight outward rotation; the elbow, depending on the occupation, one side or other of the right angle position, but never in extension; the wrist in half normal dorsal flexion; the hip in slight flexion and slight abduction and slight outward rotation; the knee in 10 degrees of flexion in a man who must walk well and stand at his work, but in 20-30 degrees of flexion in most women who sit at their tasks; the foot at a right angle to the lower leg and never abducted.

J. A. NUTTER

Our Knowledge of Vitamins—Commenting on the trend of medical research concerning vitamins, the latest report of the British Medical Research Council says:

The present situation is a curious one, upon which posterity will probably look back with great interest. We still have almost no knowledge of the nature of these elusive food substances or of their mode of action, but we have gained empirical knowledge already of the greatest practical value for the prevention of scurvy and of other grave diseases and for the promotion of health in the population.

This statement, it will be noted, emphasizes the foundation on which rests our present use of vitamins. From time to time THE JOURNAL has commented on our lack of actual knowledge of these mysterious substances, emphasizing particularly the generally accepted fact that the taking of a well-balanced diet results in providing the individual with such vitamins as are necessary to his growth and nutrition. Last week appeared a brief report of a meeting of the Chicago Medical Society devoted to this subject, and it was gratifying to have the conservative view which THE JOURNAL has emphasized substantiated by many of those who took part in the discussion. Moreover, the *British Medical Journal* in its leading editorial for February 11, reiterates that an abundant supply of vitamins exists in all fresh vegetables, and that a considerable quantity occurs in milk and meat, provided the latter substances are obtained from animals fed on fresh foods. "A normal adult," it says, "living on an ordinary diet containing a reasonable proportion of fresh vegetables is, therefore, certain of obtaining a plentiful supply of vitamins." Of all the mass of evidence which has accumulated relative to these substances, this fact is the point of greatest importance. It is, however, very ununfortunately, the one point which those commercially inclined are unwilling to recognize.—Jour. A. M. A., Mar. 11, 1922.

Therapeutic Index of Silver Arsphenamin—In order to determine the therapeutic index of silver arsphenamin, three different groups of patients were treated by ABRAHAM STRAUSS, D. M. SIDLICK, M. L. MALLAS and B. L. CRAWFORD, Philadelphia, with silver arsphenamin, arsphenamin and neo-arsphenamin, respectively. The dosage employed throughout the treatment was silver arsphenamin, 0.2 gm.; arphenamin, 0.4 gm., and neo-arsphenamin, 0.6 gm. The determination of the comparative values of the three drugs was based on the Wassermann reaction. The seropositive findings in Group 1 were changed to negative in only one instance. In Group 2 the positive Wassermann reaction became negative in thirteen cases. In Group 3 the Wassermann reaction was changed from positive to negative in nine cases. The serologic comparisons prompt the authors to conclude that the spirocheticidal activity of silver arsphenamin is far inferior to that of arsphenamin and neoarsphenamin in the treatment of syphilis.—Jour. A. M. A., Mar. 1922.

Editorial

GROUP MEDICINE

GROUP Medicine is in some respects a comparatively recent development which is attracting the attention of physicians everywhere. It may be regarded as the modern development of the almost primeval method of one physician calling in a brother practitioner to assist him in a case presenting difficulty either in diagnosis or in therapy. This development is due in great measure to the increasing complexity of both the science and art of the practice of medicine. At the present day the term is applied to the association of a few physicians, each, as a rule, having confined his studies to a special department and endeavoured to perfect his knowledge in the chosen department, more or less to the neglect of knowledge in other departments of medical practice. The attainment of complete knowledge in all departments must be considered as impossible. The general practitioner therefore labours at a disadvantage in the treatment of serious disease affecting those systems or departments which have been made a special study.

Still further, with the advance of preventive medicine, and the more general recognition of its importance it is often of very definite advantage to a patient showing signs of the wear and tear of life to have a complete examination made of all the important systems in the body in order to detect the earliest symptoms of defective functioning power; an examination which can be carried out only by specialists trained in the use of the modern complicated methods of diagnosis.

The great majority of the profession, however, must and in our opinion, always will be, general practitioners; men well grounded in the fundamental principles of medical knowledge and with a fair training in all the special departments, able to recognize disease wherever it appears and to know when the more advanced knowledge of the specialist may be advantageous or necessary for his patient. Such general practitioners become not only the medical advisers of a family but its friends and counsellors as well. Sir William Osler eulogized such as the "flower of our profession", and the increased monetary rewards which sometimes accrue to the specialist, who, as a rule, remains a stranger to his patient can, in a poor way, compare with the pleasure and satisfaction enjoyed by the family physician who lives up to his opportunities, and assumes conscientiously his responsibilities. But the more conscientious the family physician is the more frequently will he demand the assistance of specialists in solving difficult problems of diagnosis and treatment which may arise in the individuals of the families which entrust themselves to his care, and with the increase of medical knowledge groups of specialists scattered throughout the country associated so far as practicable with small well equipped hospitals will become of the greatest assistance to the general practitioner.

Several types of such groups have already arisen, and of necessity the type will vary with special conditions in the locality; but in every type it is desirable that our professional ethics be maintained in their highest and strictest form. The aim in all cases should be the best possible service to the patient. A mercenary spirit and individual selfishness will surely bring any association to complete failure.

Group medicine although it is regarded as a very modern development stretches far back into the past in the type of an associated group of physicians in attendance on the poor in the public wards of large hospitals. In a modern hospital, group medicine reaches its highest development. The association of physisians, surgeons and specialists of the highest rank with well trained assistants and nurses and an equipment obtained from almost unlimited resources should afford brilliant testimony to the many and great advantages both for rich and poor of group medicine.

In large cities smaller groups may spring up composed of two or three young active men under the leadership of a physician or surgeon of high reputation, and attract many patients who prefer the less crowded and more private rooms of such a group, and who think they obtain in such a more careful and thoughtful examination.

More important to the general practitioner, however, is the institution of such groups in towns and small communities, and in these it is all important that the institution of such groups should be with the consent and active cooperation of the majority of the physicians in the locality and if possible with public assistance from the county for the erection of a small hospital to which others in addition to the group specialists might be attached. In small towns and rural communities it would tend to the advantage of all if instead of a jealous competition some cooperation might be arranged between a number of the practitioners permitting a certain amount of specializing thus giving better service to the community, and by preventing overlapping in making long visits save unnecessary drives to the individual practitioners and allow more time for study and even for recreation. The important thought in all this for the profession is cooperation rather than competition, associated with the careful avoidance of all unethical attempts to spoil one another's reputation. Objection may be raised as to the impracticability of such a scheme, and emphasis may be placed on the modern tendency to commercialism rather than on the maintenance of a high ethical standard. Our belief is that if the leaders in the profession will give the example the younger men will strive to follow.

DIET AND HYPERTHYROIDISM

THAT thyroid secretion has an important bearing upon the metabolism of food has been strongly suggested by the effects noted following the administration of extracts of the gland. Of these effects, the elimination of nitrogen in amounts greater than the intake, the increased oxidation of fat, and the apparently impaired utilization of carbohydrates, are especially to be noted. It has been repeatedly suggested that a disturbance in the metabolism of any one of these food products may lead to the formation of intermediate products, which are diverted from the synthesis of the essential active principle of the thyroid gland.

Recently McCarrison (*Brit. Med. Jour. No. 3188, Feb. 4, 1922*) has reported some observations made during experimentation on birds, on the relation between high fat diets and the genesis of goitre. The findings of this author suggest that there exists in the body a definite "fat-thyroid-iodine balance." In the presence of an excess of certain fats (unsaturated), characterized by their ability to combine with iodine, the iodine ingested, though under ordinary conditions sufficient in amount, becomes unavailable, thus leading to enlargement of the thyroid gland. This opens up a rich field for further research in the biochemistry of goitre, with special reference to iodine and fats. That iodine is essential to the normal metabolism is fairly well established. It has been shown that the physiological activity of the thyroid gland is proportionate to its iodine content. When animals are deprived of this element, hyperplasia may occur in the gland, and this hyperplasia may be made to disappear following the administration of more iodine. Thyroxin itself does not account for the total iodine content of the thyroid gland, yet the thyroxin-free gland seems to have no effect on metabolism, and it has been suggested that the remainder of the iodine exists in some intermediate product in the formation of the thyroxin molecule.

A consideration of the chemistry of the fats suggests that the "fat-thyroid-iodine balance" will require further study. The amount of fat in the human body varies considerably even under normal circumstances. It has been estimated that in healthy individuals it represents about 18 per cent. of the body weight, and from 67 to 85 per cent. is in the form of triolein. That oleic acid seems essential to growth has been repeatedly demonstrated. In children the proportion of oleic acid in the dermal fat increases from month to month. Emaciation in children is associated with a decrease in the proportion of oleic acid. In the embryo chick a gradual increase of the iodine value of the organized fat indicates that fats are undergoing conversion into fatty acids. A rough calculation suggests that there must be some factor influencing the "fat-thyroid-iodine balance." One gram molecule of triolein (884 grams) can absorb six atoms of iodine (762 grams). In other words, the fat characterized by its ability to absorb iodine constitutes the greater part of the total fat in the body. Assuming the average normal fat content of the body to be 18 per cent., the actual available iodine in the body is insignificant in proportion to the amount that can theoretically be combined with the fat. Why iodine should combine with unsaturated fats in the intestinal canal and not do so in the other body tissues is problematic. That it does so seems indicated from the researches of McCarrison.

ON THE CAUSES WHICH TEND TO LOWER THE STANDARD OF HEALTH IN A COUNTRY

IN an address delivered before the London County Mental Hospital (*Brit. Med. Jour.* Dec. 17, 1921.) Dr. Knowles Stansfield discusses the various causes at work in England tending to the production of a population with defective health physically and mentally (the C-3 class of the recruiting service). The dictum, in his opinion, that man is the product of his heredity *plus* his environment is very true. Like produces like, but every breeder of stock knows that by judicious selection in mating, suitable housing and proper feeding he can obtain in a few generations a breed of animals greatly superior to his original stock. Unfortunately, in dealing with the human race, we can in our time only influence one or perhaps two generations; nevertheless with proper action in the removal of the causes at fault we may in time lead to important results.

Heredity is without doubt one of the great factors in the production of a defective population. The trend of modern civilization by its Poor Law System, and by its treatment of the unfit during childhood and early life tends to foster the growth of this class. The care, treatment and education given to the physically and mentally unfit may reduce materially the degree of unfitness; but if mental and moral weaklings are allowed to return to a poor environment, they fall an easy prey to evil influences. Members of this class are very improvident. They marry early and are not restrained by any problems as to how their numerous children are to be housed, fed, clothed and educated so as to permit them to take a useful place in the world.

The abuse of alcohol is another of the great factors leading to a degeneration of the type and is often inseparably associated with heredity. A great amount of work has been done by numerous investigators to determine the action of alcohol on the activity of cell life. Dogs given alcohol with their food are found to give birth to an unusual proportion of deformed or dead puppies. Observations on all the lower forms of animal life lead one to expect that the human foetus does not escape from these poisonous effects during its sojourn in the womb of a mother using alcohol freely. Dr. Stansfield states that his work during the past thirty years has brought him in close contact with the defective element of the community, and as a result of his observations he is of the strongly-held opinion that a large percentage of children with an alcoholic heredity are undersized; they develop poor resistance under any stress; their recuperative powers are feeble, and mentally their standard of intelligence is poor.

Defective or bad feeding in early life is another important factor in the production of deficient development, and of malformations, and tends to produce in the tissues a receptive soil for many diseases which culminates in ill health even amongst those who have a good heredity. The deficiency diseases, rickets, scurvy and beriberi are the underlying causes of much subsequent unfitness for the strains of life. Tuberculosis is associated with a fat deficiency. A cheap dietary is compatible with good health, if the food is properly cooked. Good sound teeth are rarely found among the poorer classes. Bad feeding and lack of proper care during infancy and childhood is without doubt an important cause of this unfortunate condition which brings so many other evils in its train.

Bad housing undoubtedly has a very important place among the many other causes of a physically defective population. Not only owing to injurious influences caused by overcrowding under all circumstances by insufficient sunlight and by generally insanitary conditions, but it also has a lowering effect upon the moral status of those who live in such circumstances.

Lastly the depressing effects of sexual excesses must be recognized. These bring the reserve balance in the bank of health so low that bills presented by other forms of stress cannot be met. Those who indulge in such excesses when met by the ordinary trials and difficulties of life offer no resistance and develop conditions of neurasthenia, psychasthenia or melancholia. These factors, in Dr. Stansfield's opinion are all important in the development of our defectives mentally and physically.

It is the duty of the medical profession to-day not only to emphasize the importance of these factors but to use all their influence to combat them and prevent them exerting such a disastrous effect on future generations.

ON THE ETIOLOGY OF RICKETS

IN a paper on the Etiology of Rickets Dr. Bruton Sweet of Auckland, N.Z. (*British Med. Jour.* Dec. 24. 1921.) calls attention to the opposing views on the etiology of rickets, chiefly the dietetic and the hygienic. The former consider that a defective diet is the cause of this disease, while the latter regard it as directly due to some defect in hygiene. A comparison between rickets as observed in Europe and Australasia indicates that the early symptoms show great similarity, but that the cause is much more benign at the Antipodes than in the older countries of Europe, and he considers it due to the great difference in the environments of children in the two continents. A great difficulty in accepting a purely dietetic theory for the etiology is the well-known fact that if a number of children are placed under the same hygienic conditions and fed on a similar ill-balanced artificial diet three things may occur: (1) The infant may remain healthy and develop normally. (2) Malnutrition may occur without sign of rickets. (3) Symptoms of rickets may make their appearance. His conclusions are as follows: (1) That rickets has not been proved to be due to a deficiency of fat soluble a vitamin in the dietary. (2) In many cases it appears to be primarily due due to a diet deficient in fresh animal food; probably a suitable protein, or to a disturbed digestive condition which prevents the assimilation of the same. (3) The striking metabolic changes in rickets are due secondarily to a deficiency in secretion of one or more of the endocrine organs: (4) Confinement of young animals, with its attendant evils, lack of sunshine, of exercise and of cleanliness, are important factors in increasing the severity of the disease.

Recent experiments carried on in several centres of research in the United States are beginning to throw new light on this still unsettled problem. It has been found that a serious mal-adjustment of the proportions of calcium or phosphorus in the food intake, or in their due absorption from the alimentary tract is a predisposing factor in the development of rachitis in the young of both animals and human subjects. A very definite preventive and even therapeutic action in cod liver oil and in an exposure of young animals to sunlight and and ultra violet rays has been proved.

Still more recently investigations have led to the conviction that there are two forms of the disease; one of which is characterized by a normal or nearly normal calcium content in the blood with a low phosphorus content; the other by a normal or nearly normal phosphorus content but a low calcium content. In a recent article by Shipley, Park, McCollum and Simmonds it is pointed out that cases of even severe rickets may occur showing no tendency to the development of symptoms of tetany, whereas in other cases, even of a mild character, tetany in a manifest or latent form may be present for many weeks. In their opinion tetany is essentially an expression of an insufficiency of the calcium ion in the nervous centres, whereas skeletal rachitis is a manifestation of some deficiency or of abnormal relative proportions in the calcium and phosphorus elements in the body fluids. With this slight difference in the etiology both disorders may be manifested simultaneously. When this is the case calcium should be administered, and associated with cod liver oil and perhaps heliotherapy to effect the promptest results. The same writers cast doubt on the identity of vitamin A and the anti-rachitic factor, on account of the much greater value possessed by cod liver oil than by butter fat in promoting normal calcium supply to osseous tissues and correcting rachitic tendencies.

THE SURGEON'S SOLILOQUY ON THE GALL-BLADDER

(*The usual apologies are extended*)

To leave or not to leave—that is the question.
Whether 'tis better for the patient's sake
To leave the gall-bladder in its normal place,
Or take it out and have no more to do
With such a viscus? To remove! or drain
For days; and by the draining try
To save it for the natural death
That flesh is heir to; 'tis a consummation
Devoutly to be wished. To drain, to save;
To save! perchance to function! ay there's the rub;
For if we take it out, no longer can we hope
That bile will find its way into it,
This must give us pause; and raise respect
For uses of this little organ.
Who would bear the twinges and the aches
The sudden cramp, the peristaltic waves,
The pangs of moving gall-stones, the sudden stop
Of flowing bile, the yellow colour,
The constant misery of an itching skin,
When he could have this organ taken out
By a keen scalpel? who would internes bear
To probe and swear o'er case reports,
But for the dread of having it removed,
The patient will he live as long and be as happy
With the viscus out as if t'were left behind,
Puzzles the surgeon and makes him cling to what
The body has, than fly to something that he wots not of.
Thus conscience should make cowards of us all,
And thus the present style of amputation
May give place to that of conservation,
And enterprises of great pitch and moment:
The beach in summer, the brand new car,
The golf club membership, the summer fishing trip,
With this regard are turned awry
And fade into the distance.
For if the thing is left within, we cannot
Fee as much alas! as if t'were taken out!

E.J.M.

The Association

ANNUAL MEETINGS OF
CANADIAN MEDICAL ASSOCIATION
CANADIAN RADIOLOGICAL ASSOCIATION
CANADIAN SOCIETY OF ANAESTHETISTS

IN connection with the coming meeting at Winnipeg we have received the following information from the Local Committee:

TRANSPORTATION

Arrangements have been made by the Association whereby fare and one-half return will apply on Canadian Pacific Railway and Canadian National Railway all over Canada. The following stipulations by the railroads, however, are important. Delegates must buy a single ticket to Winnipeg and *when purchasing ticket, ask the agent for a convention certificate.* This certificate is vised by the secretary at headquarters in Winnipeg, and then is good for half fare back.

A minimum number of these certificates is required, and should this minimum not be reached, the reduction will not be made. It is, therefore, most important to secure convention certificate when purchasing single ticket.

HOTELS

Good hotel accommodation will be provided for all making reservations. For those who do not, the same cannot be definitely promised.

The committee, therefore, would urge that each doctor who purposes attending this Convention fill in the card he will receive and mail same promptly. Accommodation will be reserved in order received. Information booths will be established at the C. P. R. and Union Depots and to these visitors are requested to report on arrival in order that they may be conveyed to their hotels.

PROGRAMME

The Programme Committee has the assurance of being able to present a varied and interesting list of papers and addresses. There is no lack of material, and the response to the requests made by the Committee has been most gratifying. The fact that the Canadian Radiological Society and the Canadian Society of Anæsthetists are meeting under practically the same arrangements as the Association, and at the same time, considerably broadens the scope of the convention. In this regard it is a pleasure to announce that Dr. Lewis Gregory Cole, of New York City, has accepted an invitation to present a paper on "Rœntgen Indications for Surgical Procedures on Gastric Ulcer," and that the Radiological Society expect to receive an extensive exhibit of plates from Dr. Carmen, of Rochester.

The annual address in Medicine will be given by Dr. Llewellys F. Barker, of Baltimore, before an open evening meeting of the Association, and, in addition, Dr. Barker will present a short paper on a medical subject at the opening of the medical section.

The following papers in medicine have been secured for the general afternoon meetings:

Dr. Campbell Howard, of Iowa—"Some Phases of Dysthyroidism."

Dr. John L. Todd, of Montreal—"The Fruits of Medical Research."

Dr. D. A. Stewart, of Ninette—"Tuberculosis of the Intestine."

For the medical section the following interesting papers have been secured up to date:

Dr. C. F. Martin, of Montreal—"Observations on Some Methods of Examination in Gastric Disease."

Dr. Alex. McPhedran, of Toronto—"Psychotherapy."

Dr. Colin K. Russell, of Montreal—"Epidemic Encephalitis and the Influence of Horse-Serum in Treatment."

Dr. Wm. Goldie, of Toronto—"The Reasons for the Variations of Symptoms in Gastric Ulcer."

Dr. Allan Brown, of Toronto—"Effects of a High Protein Diet in the Treatment of Chronic Intestinal Indigestion in Children."

Doctors F. G. Banting and C. H. Best, of Toronto—"Treatment of Experimental Diabetes and Diabetes Mellitus by Pancreatic Extracts."

Dr. K. A. Mackenzie, of Halifax—"Functional Paraplegia with a Case-Report."

Dr. Allison Cumming, of Vancouver—"Some Data in Diabetes Mellitus," in conjunction with Dr. R. E. Coleman, of the Laboratory Staff of the Vancouver General Hospital.

Dr. S. J. S. Peirce, of Brandon—"Some Clinical Studies in Blood Cholesterol."

Dr. Charles Hunter, of Winnipeg—"Application of the New Psychology by the Internist and General Practitioner."

Dr. Fred. Young, of Winnipeg—"Direct Measurement of Venous Pressure."

Dr. A. J. Burridge, of Winnipeg—"Auricular Fibrillation."

The Address in Surgery will be given by Dr. J. M. T. Finney, of Baltimore, and a full programme has been arranged, some of the papers being as follows:

Dr. Primrose—"Tumor of the Breast, Malignant and Benign."

Drs. Bazin and Gurd—"Lung Abscess."

Dr. Risdon—"Plastic Surgery, Head and Neck."

Dr. Gordon, Vancouver, will describe a new Cysto-urethroscope.

Dr. W. H. B. Aikins, of Toronto—"Radium Therapy."

Dr. Alex. McK. Campbell—"Modern Viewpoints in Intestinal Anastomosis."

Dr. R. B. Deane—"Coxa Plana—diagnosis and treatment."

Dr. Lewis G. Cole, of New York, will also present a paper before this section.

Gall Bladder diseases will be dealt with by Drs. Graham and Boyd.

In addition to this outline the Committee has on hand a number of papers which have been contributed by men resident in Winnipeg.

An evening meeting, which will be open to the public, is being arranged. It is hoped to secure as speakers eminent men from amongst the visitors.

The Annual Meeting of the Canadian Medical Protective Association will be held immediately at the close of one of the morning sessions.

A museum of pathological tissues is being arranged, and while much of the material will be drawn from the Museum of the Medical College, Winnipeg, valuable contributions are promised from other Canadian Medical Schools. It is the intention to have a morning demonstration with discussion by Drs. Miller, Campbell Howard, Primrose and Boyd.

CANADIAN RADIOLOGICAL SOCIETY

Dr. Lewis Gregory Cole, New York City; Dr. Carman, Mayo Clinic, Rochester; Dr. Bissell, Minneapolis; Dr. Stephens, Detroit; Dr. Orndorff, Chicago; Dr. Tyler, Omaha, are some of the visiting Radiologists who will take part in the programme.

Suitable space has been obtained for a large scientific exhibit, and any one having cases of unusual interest will confer a favour by sending plates in three days before the opening date of the meeting. Your hearty co-operation will be much appreciated.

DON'T FORGET THE DATES—MAKE RESERVATIONS EARLY

J. C. McMillan, M.D.,
904 Boyd Bldg., Winnipeg.
Chairman, Local Committee on Arrangements.

CANADIAN SOCIETY OF ANÆSTHETISTS

The second annual meeting of this Society will be held in conjunction with the Canadian Medical Association June 20th to 21st.

Arrangements have been made to hold the sessions at Winnipeg at the Royal Alexandra Hotel. The social activities of this Society will be held jointly with those of the Canadian Medical Association.

A gavel presentation by the Society's first President—Samuel Johnston, Toronto.

The following papers have so far been promised:

Wm. Webster, Winnipeg—"President's Address—Anaesthesia of the New Ethers."

Professor Ardrey W. Downs, University of Alberta, Edmonton.—"The Reaction of the Blood in reference to the regulation of Respiration and the influence of Anaesthesia thereon."

E. I. McKesson, Toledo, Ohio—"Eleven Years' Observation of the Minute Volume of Respiration in Anæsthesia with a Discussion of some of the Factors Influencing the Same."

Henry G. Barbour, Raymond L. Stehle and Wesley Bourne, Montreal.—"Studies of Acidosis in Anæsthesia."

Beaumont S. Cornell, Brockville, Ont.—"The Breathing of Nephritics."

J. W. Duncan, Montreal—"On the Relief of Pain in Obstetrics."

D. C. Aikenhead, Winnipeg—"A Review of the Post-Operative Pulmonary Complications in 7,000 cases of Anæsthesia."

W. B. Howell, Montreal—"Ether Anæsthesia and Fatty Liver."

F. H. McMechan, M.D., Avon Lake, O.—"Newer Trends in Anæsthesia."

Raymond L. Stehle and Wesley Bourne, M.D., Montreal—"Anæsthetic Properties of Pure Ether."

W. G. Hepburn, Montreal—"A Review of Spinal Anæsthesia."

E. I. McKesson, Toledo, O.—"Nitrous Oxide-Oxygen in Nose and Throat Surgery."

Dr. Slater, Winnipeg—"The Welfare of the Surgical Patient."

W. B. Howell, W. G. Hepburn and Wesley Bourne, Montreal—"On the Teaching of Anæsthesia to Medical Students."

K. G. Grant, Winnipeg—"The Post-Operative Incidence of Acetone and CO^2 Content of the Blood."

An entire morning is set aside for clinical demonstrations in anaethesia by leading anaesthetists.

Final Executive Session.

The date of the meeting is the same as that of the C.M.A.

Dr. Wm. Webster,
General Hospital, Winnipeg, Man.
Local Representative.

COMMERCIAL EXHIBITS

A large amount of space in close proximity to the rooms used by the Association for its Meetings has been allotted for Commercial Exhibits. From present indications the exhibits will be extensive and varied.

ENTERTAINMENT

Details of the Entertainment Programme have not been perfected, as the Programme Committee has not yet decided upon the amount of time that will be available for recreational features. Generally speaking, however, our visitors, especially the ladies, may be assured of a good time.

For those of athletic inclination, every facility will be provided. All the Winnipeg Golf Courses will be open to members of the Association and the ladies who accompany them. Luncheons will be held daily at the Royal Alexandra Hotel immediately following the sectional and business meetings, at which brief addresses will be made by non-medical speakers. The idea in holding these luncheons is that the work of the sections and various committees may be more consolidated and punctual. An evening Reception and Dance at the Legislative Buildings will probably be held. The President and Mrs. Montgomery will hold an afternoon reception at their country home. Trips to Lower Fort Garry and other points of interest are being arranged. Special Ladies' Luncheons, Teas and Golfing Contests are being planned. One evening will be devoted to a Dinner and Vaudeville entertainment.

INQUIRIES

The following Local Officials will be glad to answer any inquiries:—

Dr. F. C. Bell, Medical College, Secretary Programme Committee and Chairman, Commercial Exhibits.

Dr. G. S. Fahrni, 507 Boyd Building, Chairman, Hotels and Transportation Committee.

Dr. J. C. McMillan, 904 Boyd Building, Local Representative Canadian Radiological Society.

Dr. Wm. Webster, General Hospital, President Canadian Society of Anæsthetists.

Dr. A. T. Mathers, Psychopathic Hospital Local Secretary, C.M.A.

Fifty-Third Annual Meeting

Canadian Medical Association

WINNIPEG, JUNE 20th to 23rd, 1922

E. W. MONTGOMERY, WINNIPEG

President

Correspondence

SPINAL PRESSURE

(*From Toronto Star Weekly of February 18, 1922*),

Editor Star Weekly. The Star weekly of February 11th contains a lengthy article explaining the causation of bodily ailments namely, two vertebrae coming into apposition whereby the nerve supply to a part is cut off by pressure on the nerve; and the cure for same namely, adjusting the vertebrae whereby the pressure is removed from the nerve permitting the nerve energy or life or whatever it is to flow through making the sick member or organ well.

By way of illustration a hose pipe is referred to, and quite logically it is pointed out that if one steps on the hose completely compressing it the water will fail to flow through until the pressure is removed. But this pre-supposes that both the hose pipe and the foot (the nerve and the pressure) are available.

Now I have always understood that there were ten or twelve cranial nerves which went directly from the brain to their respective destinations without emanating from the spinal column (hose pipe) at all. These nerves, according to the anatomists and physiologists control the senses of smelling, seeing, hearing and tasting and constitute the innervation of the head. By what vertebrae, then, do they become compressed and how does chiropractic spinal adjustment start the juice flowing through them to relieve the many ills affecting the eyes, ears, nose, etc., to which the human is heir? Perhaps the scientists are all wrong and there aren't any cranial nerves at all.

Again returning to the hose pipe—so long as it is compressed there is certainly no flow of water. How then before the advent of chiropractors did any sick part of the human body become well when there were no practitioners to separate jammed vertebrae? And by what freak of nature does the compressed nerve of the patient (the millions of patients) of the recognized medical practitioner be relieved whereby recovery ensues and the individual becomes perfectly well? Maybe he isn't cured at all—just thinks he is.

What strange phenomenon dislocated so many vertebrae during the so-called influenza epidemics?

So-called typhoid fever used to be a plague and a scourge. Why is it that we see so little of it now? Something must have destroyed the atom that went around dislocating the vertebral culprits that were responsible for instance for the many thousands of cases of typhoid among the British troops during the South African War.

Said the first comedian, "We would have some ham and eggs if we had some ham." "Yes," answered the second comedian, "And if we had some eggs."

You cannot put your foot on the hose if it isn't there and especially if your foot isn't there also.

Perhaps the chiropractor who uses the hose pipe illustration will give a common sense answer to the points which I have raised.

Yours for the truth,

Toronto. CITIZEN

EDITOR'S NOTE—Citizen asks some pertinent questions. Greater light will inceasingly be thrown upon the whole matter of irregular prac- questions. Greater light will increasingly be formed. In this matter the public looks to us for rational, unbiased information.

Men and Books

THE EARLY HISTORY OF VACCINATION

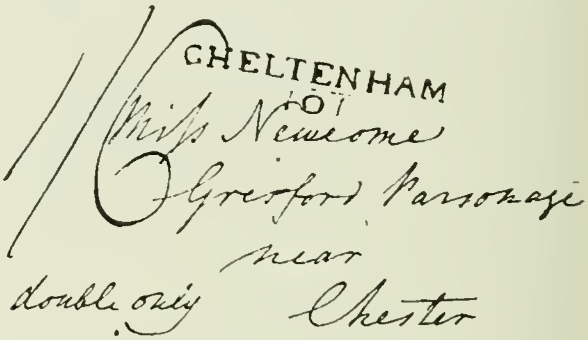
An Unpublished Letter by Edward Jenner

A valuable autograph letter by the great Edward Jenner, apparently never made public, has been placed before us, by a student in the School of Graduate Nurses at McGill.* It is written to a Miss Newcome, and is evidently addressed through her to certain ladies who appear to have been conducting a campaign on behalf of vaccination against small-pox, in Chester and the vicinity, and it answers, simply and convincingly, a number of questions on the subject that have been propounded in the previous letter to which it is a reply. It thus gives an interesting insight into the propaganda used in England for the introduction of this great measure, and also into the thoroughly scientific attitude and attributes of its famous English expositor.

In this connection it is interesting to read, in Baron's life of Jenner* that, in addition to professional men all over the world, large numbers of lay people, both ladies and gentlemen, successfully practised vaccination at this time; among these he especially mentions the Rev. Rowland Hill, Miss Bayley of Hope, near Manchester, and Mrs. Kingscote of Hinton House, Hants. He says:

"Notwithstanding the clamour which was raised against unprofessional vaccinators, they rendered good service to the cause. They were obedient and teachable, and certainly in the main conducted the practice with greater success than many professional persons. I have often heard Dr. Jenner speak with satisfaction of the conduct of the ladies. Miss Bayley in particular managed the process with much skill and perseverance. In order to detect any case of failure that might occur in her practice she told the poor that she would give a reward of five shillings to anyone who could produce an instance of small-pox after vaccination performed by her. Out of 2,600 cases, only one was brought to claim the reward, but on referring to her journal she found a mark against the name, indicating her belief that vaccination had not properly taken effect."

The letter is dated nearly 115 years ago, on April 10th, 1808, and is written in a clear, flowing angular hand. It occupies eight pages in two double sheets, which are folded and sealed in the manner of the time, and addressed as follows on the blank surface:



CHELTENHAM
107
Miss Newcome
Gresford Parsonage
near
Chester
double only

Facsimile (photograph) of address on letter here published by Edw. Jenner.

It reads as follows:-

Dear Ladies:

To you who know so well how variously my time is occupied, I scarcely need make any apology for so long delaying to answer your obliging Letter. Since your departure I have been necessitated to pay a visit to the Metropolis and stay a fortnight there, a circumstance that has added not a little to the general confusion of my epistolary concerns; however without saying more on these subjects I will at once congratulate you on your having opened the Vaccine Campaign so successfully. May this species of warfare never terminate till you have driven from your Country the most formidable Foe that ever invaded it. I should have enjoyed being of your party when your first visit commenced among the Cottagers, but must own that nothing would have delighted me more than hearing your Lectures on Vaccination delivered to the Clergyman, whom you delegated to take charge of the business on your absence.

I will now proceed to answer your questions in the order they occur.

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*For this privilage we are indebted to Miss Victoria Winslow, who obtained the letter on loan from its owner, Mrs. Cartwright Allen, of Millbrook, Ont.

1st As to the mark—Is the mark similar to the natural cowpock? Yes, if the Pock by chance (for this is a very rare occurrence) assumed the same form as that produced by a Lancet. Observe—every case of Cowpox. whether casually from the Cow or artificially excited, must necessarily be a case of inoculation, as the disease cannot arise spontaneously on the human Being nor by any other means than by bringing the infected matter in contact with the skin.

2nd Is the security obtained on the 8th day? As far as I have seen always provided the Pock has proceeded regularly up to that period of time.

3rd Is it a preventive of itself?

Not uniformly so.

4th Why is the *scab* the least eligible source of infection?

The scab must of course be made up of Cowpock matter formed at different periods of its progress, hence I conclude that its edges are less likely to produce the perfect Pock than its centre, because the latter contains the perfect in its inspissated state, the former can only be that which was formed after the *Areola* (the red blush that surrounds the Pustule) was complete.

The little Schoolmaster deceived us having never appeared at headquarters since he made, in your presence, his *faithful* promises.

I do admire the mode in which you keep your Cases, and think your accuracy exceeds that of any Institution or private Vaccination in the British Empire, perhaps in the World. Your failing frequently to infect must have arisen from the lancet being placed in timid hands; and to this cause I also attribute the Pustule being smaller on the 8th day than you usually saw it here. Don't be afraid in future to make your punctures larger. Some of the irregularities you mention were clearly owing to coincident diseases of the Skin. Further comments or observations would be needless to *you* who are so competent to make them yourselves.

The Ringwood cases, foolishly enough, seem to have made an impression everywhere. I must request you to produce Mr. Blair's pamphlet on this Subject; and you will be much pleased with the perusal of a small pamphlet from the pen of ingenious Mr. Scully of Totnes on Vaccination. As you will find yourselves occasionally drawn into controversy a vaccine Library will be a Tower of defence against *our* enemies.

* * *

One question of some importance still remains to be answered. A fine little boy about six years old came to my House in Town last spring and presented me with a nosegay. He was accompanied by his mother. "Pray, young Gentleman who are you," said I. "Edward Jenner" said the boy. The mother then told me that his unhappy father died of the small-pox just at the time he was born, and in the same room; and that Dr. King, who attended her, vaccinated her Infant at *half an hour old.* Thus was he shielded from the horrid Pestilence that had destroyed his Father. Don't you think the little urchin's bouquet smelt sweet? On an emergency no period of human existence is too early for vaccination, but I must remark that when it is to our choice, it may be prudent to defer the operation till an infant is a month old. Your seal bears a very correct representation of the Vaccine pustule.

With mine & Mrs Jenner's best wishes believe
me very faithfully Yours [illegible]
Edw. Jenner
Cheltenham 11 April 1808

The reference in this letter to the *Ringwood Cases* is also of great interest. The same author relates, Vol. Sp. 108-109, that an epidemic had broken out at Ringwood, Hampshire, about the middle of September, 1807, which spread rapidly and with great mortality. Vaccination was commenced on October 23rd., after all had been previously exposed to small-pox. Some 200 persons were, nevertheless, successfully vaccinated, and no person in the vicinity appears to have caught the small-pox after vaccination. Some supposed failures were, however, reported. These were made the subject of a false and exaggerated alarm by the opponents of the cause. The affair was brought before the Royal Jennerian Society, and was made the subject of a thorough public investigation. The result was a complete and triumphant refutation by Jenner and his friends of the assertions made through the blind and inveterate opposition of the anti-vaccinationists of the time.

M. E. ABBOTT

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*The Life of Edward Jenner, by John Baron, M.D., F.R.S., London, 1838.

THE LIFE OF JACOB HENLE*

This is the first biography in the English language of that humorous and human personality known as Jacob Henle. The measure of a man's success in life is often revealed by his character in old age. Let it be said at once that Henle's was a delightful old age. There are many things about Henle which suggest that familiar and loved Bostonian—Jacobi. For Henle was also a Jew, although early in his life the entire family were converted to Christianity.

During his student days in Heidelberg while undetermined whether to plan a clinical or academic career, he expressed himself charmingly in the following letter:-

"I am still undecided regarding my future. Much draws me to the practical, especially the position of a physician who knows how to make friends and inspire confidence. On the other hand. I have the knowledge that I can pursue the career of a teacher, and to sit in a lecturer's chair with believing open-mouthed youngsters in front of me, devouring with pointed pens every word as though it were an oracle, and laughing at every poor joke which I surely will not fail to make ex-officio—this is not a bad picture. But the years of a *privat docent!* the years of dependence and huddling; and on the other hand, the seven first lean years of practice. In short, I am and *remain undecided.*" Johannes Müller easily persuaded him to make the decision which eventually meant so much for anatomy.

About this time in a letter to his parents he describes his plan of life and that he shall in the proper time "marry a young, beautiful, wise and rich girl, who speaks French, plays the piano and knows how to manage horses." His subsequent romantic marriage to Elise Egloff, the nursing maid, and a year or so after her death to Marie Richter hardly bear out this youthful prophesy.

The dominating passion of his extra-professional life was music which to him was ever a solace and way of peace. The "*hobby*" the importance of which Osler never tired of emphasizing.

His method of work, his attitude towards the student and the profession, his difficulties in reforming various faculties and his eventual peaceful old age at Göttingen are all well narrated in the volume under review.

One indeed feels grateful that such men as Dr. Victor Robinson are interesting themselves in medical biography, that the fruits of their labour, by a knowledge of the past, may further the art and practice of medicine.

H. P. Wright

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*By Victor Robinson, M.D. Published by Medical Life Company, New York. Price $3.00, 1921.

Antiscorbutic Value of Dehydrated Fruits Experiments were made by Phillip F. Eckman, Minneapolis (Journal A. M. A., March 4, 1922), to determine to what extent, if at all, the antiscorbutic vitamins are contained in dehydrated fruits. The experiments consisted in feeding observations on guinea-pigs. The dried fruits used were peaches, apricots, apples, pears, prunes, cherries and loganberries. Water and alfalfa-flour mixture were fed ad libitum, and varying amounts of the fruit were used. When scurvy symptoms were prominent and marked loss of weight occurred, the amount of fruit was increased in the effort to prevent a fatal issue of the disease Necropsies on practically all of the animals were held, and in all cases definite evidences of scurvy were observed, such as subperiosteal hemorrhages, especially in the limbs and cheeks, evidence of intramuscular and subcutaneous hemorrhages, hemorrhagic nodules at the costochondral junctions, and enlarged and hemorrhagic suprarenals. The principal antemortem signs were marked loss of weight and appetite, subcutaneous hemorrhages, marked psuedoparalysis of the limbs, and in one case on apples a prolapse of the rectum. From these experiements it appears evident that the only one of the dried fruits tested which contains sufficient antiscorbutic vitamin to maintain the life of a guinea-pig when fed in not too excessive quantities is the peach. Of this fruit it appears that 4 gm. a day, although insufficient to prevent scurvy, delays it for three or four months. Although further trial did not bear it out, earlier experiments indicated some value in apricot and apples. Pears, prunes, loganberries and cherries seemed to have even less value'—Jour. A. M. A., Mar 4, 1922.

Abstracts from Current Literature

SURGERY

Pre-Operative Preparation of Patients with Obstructive Jaundice. Walters, W.: Surg. and Obstet., Dec. 1921, Vol. 33.

The article is based on reports from patients operated on in Mayo Clinic—1918-19-20 in which blood coagulation time estimations were tabulated.

The principal cause of death as shown at autopsy was due to intra-abdominal haemorrhage, a continuous oozing from the tissues taking place. The exact source of haemorrhage could not be determined. Post-operative haemorrhage occurred in most cases where the coagulation time of venous blood was longer than 9 minutes.

The author concludes from a series of experiments on animals and from its application to patients operated upon that intravenous injections of 5 c.c. of a 10% solution of Calcium Chloride over a period of three days greatly diminishes the coagulation time and the toxicity of blood.

Jaundiced patients are given large quantities of carbo-hydrates by mouth and along with this 15% solution glucose in tap water by proctoclysis using the Murphy drip, because carbohydrates act in a protective manner to prevent the disintegration of body proteins. 4000 c.c. of water daily is given by mouth to increase the body fluids and to aid in the elimination of bile pigments.

Great care should be taken to produce as little trauma to the tissues as possible especially to the liver, and when possible Cholecystectomy should not be performed as a primary operation because of the injury done to the liver.

When calcium chloride does not sufficiently diminish the coagulation time blood transfusion is indicated 24-48 hours before operation.

B. F. MACNAUGHTON

Resection vs. Gastro-enterostomy in the Treatment of Gastric and Duodenal Ulcer. De Quervain, F.: Surg. Gynaec. and Obst., Jan. 1922, Vol. 34.

This article is based upon the careful investigation of 247 cases which were submitted to operation.

The indications for operation are repeated haemorrhage, pyloric stenosis and failure to obtain relief from symptoms after prolonged medical treatment.

Special points brought out in the diagnosis are that only 2-5 of gastric and 1-3 of duodenal ulcers show hyperacidity. Lactic acid was not present in one case of benign ulcer. The benzidene and guaiac tests for occult blood gave 65% positive results in duodenal, and 50% in gastric ulcers. Roentgen examination gave exact localization of 87% of gastric ulcer. Duodenal ulcers were diagnosed by a process of exclusion in 54%. In 6 per cent of cases a positive diagnosis of benign from malignant ulcer could not be made without submitting a section to microscopic examination. Carcinomatous change in the benign ulcer was definitely shown in 1.4% of cases.

The mortality of the gastro-enterostomies was 6.5%. This high percentage was explained by the fact that the most unfavourable ulcers were submitted to this operation. Resection gave 7.7% mortality. The chief causes of death were lung complications e.g. pneumonia and emboli. Jejunal ulcer was observed eight times. It was much more common in cases treated by pyloric exclusion and also when non-absorbable sutures were used.

Cases that are free from symptoms after four years of repeated examination are classified as cures. Gastro-enterostomy gave 75% of cures, whilst transverse excision of stomach or the sleeve operation gave 90%. Duodenal ulcers showed 65% of cures by gastro-enterostomy whilst in 9 cases treated by excision, all were cured.

The advantages of the transverse excision of stomach are the higher percentage of cures, the absence from danger of late bleeding from the ulcer and the rarity of peptic ulcer following it. The disadvantages are that it is a more severe operation and consequently there is a greater opportunity for the production of emboli and lung complications. It also requires a more skilled operator and assistants. W. ALLAN CURRY

Studies of the Function of the Gall Bladder. Harer, W. B., Hargis, E. H. and Van Meter, V. C.: Surg. Gyn. and Obstet., March 1922, Vol. 34.

The doubt which exists today, as to the actual function of the gall bladder, led the writers to investigate the various theories which have been advanced by the majority of medical authorities. The fact that the gall bladder is missing in such animals as the rat, deer and horse has prompted many prominent men to consider the organ as a vestigial one. Removal of gall bladder in animals which do possess one, entails no serious effects. If this theory is the correct one why should the organ be as well developed in man, as it is in the lowest vertebrate? One of the most popular theories is that the gall bladder it simply a reservoir for storing the surplus bile. Its capacity has been estimated at approximately 50 cubic centimeters, while the total daily secretion of bile is estimated at about 1000 cubic centimeters. Granting that the gall bladder can expand to three or four times its normal capacity, as stated by C. H. Mayo, it would still be inadequate to hold all the bile secreted between meals. If the organ acts as a reservoir we should expect to find a layer of muscle in the wall sufficiently strong to empty the viscus quickly. Muscular tissue is present which causes rhythmic contractions at the rate of five to eight per minute but the pressure exerted is not much more than the maximum secretion pressure of the bile. Sweet considers that the muscle tissue in the wall of the gall bladder is entirely inadequate to empty the organ, the act being performed by means of pressure from adjacent distended organs and by the milking action of the peristaltic waves.

Another theory ascribed to the gall bladder is that it is a regulator of the flow of bile. Most animals have a definite sphincter muscle at the ampulla of the vater. Where a gall bladder is present, the sphincter is much stronger and the bile is discharged intermittently. After cholecystectomy the intermittent discharge of bile is continued for some time. This leads one to believe that the sphincter is more responsible for the regulation of the flow than is the presence or absence of the gall bladder.

Some consider that the gall bladder in some way regulates the pressure between the liver and pancreas. One of the strongest arguments against this theory is the fact that in only 35 per cent of all cases is the arrangement of the pancreatic ducts and bile ducts such as to make regurgitation into the pancreas possible.

There seems no doubt that concentration of the bile takes place in the gall bladder, the cystic bile being 6 to 10 times as rich in solids as is the hepatic bile. After cholecystogastrostomy the gall bladder undergoes atrophy being unable to perform its function. As the gall bladder has a very rich lymphatic supply and a poor venous supply, the concentration is more likely due to the former system. Solutions injected into the gall bladder are recovered very soon afterward in the lymphatics.

GEO. A. FLEET

Benign Tumours of the Stomach. Eustermann, Geo. B. and Senty, Elmer G.: Surg. Gyn. and Obst., Jan. 1922, Vol. 34.

A pre-operative diagnosis of benign gastric neoplasm is exceedingly difficult in the majority of cases, and has rarely been made, at least until very recently.

This article is based upon clinical material comprising 27 cases, all verified at operation, and composed of 10 myomata, 5 fibromata, 4 angiomata, 2 dermoids, 1 gastric polyposis, 2 adenomata and 3 polypi. The 27 patients in the series were under observation in the Mayo Clinic between the years 1907 and 1921, and they represent 1.3% of all the gastric tumours which have been operated upon in that Clinic.

Seventeen of the entire number were classified as primary growths, because they were found to be the chief cause of the patient's complaint. In 13 cases the tumours were in close proximity to the pylorus, in 5 they occupied the posterior wall, in 5 the anterior wall, and in 2 they were generally distributed throughout the stomach. In one case oesophagus and jejunum were involved, and in one the exact location is not stated.

Size and shape of tumours varied because of various types encountered. The majority were sessile rather than pedunculated.

Gastric analysis and symptomatology afforded little aid in diagnosis. Seven patients had palpable tumours. Average loss of weight in primary group was 25 lbs. Ten patients had recurring haemorrhage with secondary anaemia and weakness. Seven patients had obstruction, and one with fibromyoma had an intussusception of the posterior wall of the stomach into the duodenum. Severe painful seizures, simulating gall stone colic, were noted in several cases where tumour was close to pylorus; while others in this position had the duodenal ulcer syndrome.

The roentgenologic appearance of large tumours is indistinguishable from that of gastric cancer.

Fifty per cent of benign tumours are found in patients over 40. There is no characteristic syndrome, and gastric chemism ranges from achylia to hyperacidity with hypersecretion.

Common complications are recurring haemorrhage and pyloric obstruction.

Often patients with benign gastric tumours are refused operation because the condition is regarded as malignant and inoperable. The true nature of the lesion is discovered only when the patient insists upon operation, and in those who are operated upon the end results are excellent. H. K. MACDONALD

Cancer of the Prostate and Seminal Vesicles Treated with Radium. Denning, C. L.: Surg. Gynae. and Obst., Jan. 1922, Vol 34. Gynae. and Obst., Jan. 1922, Vol. 34.

Prostate cancer is one of the slowest growing malignant tumours and even after an elapse of 4 to 5 years after treatment, we may not be justified in pronouncing a cure. All cases in this series were patients with advanced cancer, who were considered beyond the operable stage. The prostate was enlarged, nodular, fixed and stony hard. Seminal vesicles were involved in 90% of cases. The rectal wall was involved in 15% of cases, but there was not any ulceration of the mucous membrane. In many cases lymph glands along the lateral walls of the pelvis were palpably enlarged.

The radium was given in doses of 4.000 to 5.000 milligram hours over a period of 6 to 8 weeks, after which there was an interval of 2 to 3 months, when the second series was commenced. The treatment was administered per rectum, per urethram and per vesicam as described by Dr. Hugh Young. In addition, needle treatment of 500 to 2000 milligram hours should be given through the perineum.

Results: (1) Radium gave symptomatic relief and return to normal urination in 75% of cases. (2) Radium relieved the pain in the back in 50% of cases suffering from metastasis. (3) Locally, in 55 cases out of 100 a marked change in the consistence and hardness was noted. The prostate decreased in size, and stony like hardness was changed to a definite elasticity. (4) Five cases showed good results. They are entirely free from symptoms. The prostate feels normal in size and consistency. They have enjoyed good health for six years since the commencement of their treatment.

Mortality: The average length of life in 48 cases from the beginning of symptoms was 25 years. 23 cases could not be traced. The remainder are still under treatment.

Histological: Examination of the specimens removed at operation show the action of radium to be of two kinds (1) a gradual disappearance of cancer tissue and the development of fibrous tissue. (2) Necrosis of the cells. The effect of radium on the tissues does not correspond in all cases to the amount of radium used.

W. ALLAN CURRY

Essential Haematuria. Levy, Chas. S.: Surg. Gynae. and Obst., Jan. 1922, Vol. 34.

Essential or idiopathic haematuria is a condition of renal bleeding the etiology of which cannot be determined. It is a clinical diagnosis and should only be offered when all the present known urological methods have been employed with negative results.

It is evident that there is no one accepted explanation from a pathological standpoint, of a haematuria with negative urological findings.

This paper comprises the clinical studies of 30 cases, and the conclusions are drawn from these 30 cases plus a questionnaire, framed so as to include the possibility of subsequent development of nephritis, urinary tuberculosis, calculi of urinary tract, renal tumour, operative procedure on kidney, and recurrence of haematuria.

The age incidence varies from 10 to 71 years, and in 36% of the cases the haematuria occurred in the fourth decade.

The bleeding is for the most part symptomless. In most cases the sign developed spontaneously, and exertion, violent exercise, etc., do not seem to play a significant role.

The right kidney was responsible in 17 cases; left kidney in 13. In no case were both kidneys involved.

In the treatment of the condition the results of operative procedure have not been better than those of non-operative methods.

In this series, 5 had operative interference for control of the symptom. Nephrotomy in 3 cases, decapsulation in one case, and nephrectomy in one case. Nephrectomy is the only operation ever indicated, and that only as an emergency measure to save a patient from bleeding to death, and not as a routine procedure for intermittent haematuria.

Non-operative measures have been used with success. These have consisted of intra-pelvic injection of silver nitrate and adrenalin, and of the passage of a ureteral catheter; the oral administration of calcium lactate and the subcutaneous or intramuscular injection of horse serum. Of these the intra-pelvic measures have given best results. It is suggested that the pelvis of the kidney be completely distended when this form of treatment is employed, as it has been shown that the haematuria often disappeared after the injection of an opaque medium for pyelographic study.

The 30 cases have been followed from one month to 12½ years. In 12 cases there has been no recurrence. In the remaining 18, recurrence occurred.

Spontaneous cessation occurs frequently and as a rule the general health of the individual is not affected by the loss of blood.

From an analysis of the questionnaire we can infer that none of the patients developed nephritis, renal or ureteral calculus, tuberculosis in any form, or renal tumour, and that the prognosis as regards life is favorable in spite of the loss of blood, and the recurrence of the haematuria.

H. K. MACDONALD

MEDICINE

Mishaps of Lumbar Puncture. Milian, G.: Paris Medical, Feb. 11, 1922.

Unfortunately, sequelae from lumbar puncture are often troublesome. Not infrequently on the day following puncture, there is an intense progressive headache, often increasing to extreme violence; vomiting accompanies the pain, copious and excessive in character. The patient cannot assume the erect posture, for the headache and vomiting are relieved only by the recumbent posture. For several days the patient is obliged to remain in bed, assumes a pallor and suffers from general malaise. It is impossible to know by what means the accidents can be prevented. Certain patients there are who are never affected by lumbar puncture, as, for example, those in whom exist a serious cerebral lesion, whether it be fracture, meningitis, cerebral haemorrhage, or the like. Tabetics likewise tolerate the puncture with remarkable indifference, and the removal of several c.c. of fluid leaves them indifferent to its effects. This should cause no surprise when one recalls the visceral analgesias that occur in taking it: it is that of cerebral analgesia, comparable to that of the testes or trachea. Again, those with increased pressure of the cerebrospinal fluid likewise tolerate the puncture better than others, while accidents more frequently occur where the tension is normal or diminished. Aspiration of the fluid by a syringe is also liable to produce unpleasant results.

There is some doubt as to whether the amount of fluid withdrawn is directly related to accidents of this kind; accidents occur frequently with a minimum amount of fluid withdrawn. There are those who believe that trouble arises from a leakage of the fluid (after puncture) into the neighbouring tissues. This is borne out by the fact that so often the unpleasant symptoms disappear about five days after puncture, which corresponds histologically to the time necessary for cicatrization.

It is essential to use a small needle; to make as small an opening as possible in the dura mater; to use as perfect technique as is within the power of the physician; to let the fluid run spontaneously, not to aspirate it.

There are certain types of patients with whom lumbar puncture causes great disturbance, such, for example, as the anxiety-neurosis melancholics, defectives with ideas of persecution, and most of all, the chronic demented in the second period of their disease. As prophylactic technique, one should always massage the punctured area with absorbent cotton; to place the patient face downwards with the head lower and the thighs raised; in other words, to assume the knee and elbow position in a modified form for about ten minutes after the operation, and then to lie a while in the recumbent position—face downwards and not on the back. The author spurns the idea of using collodium over the opening, and recommends at most a small piece of aseptic gauze held on by plaster. For the treatment of these accidents, he recommends the horizontal decubitus and, if necessary, a small dose of morphine or bromide.

C. F. MARTIN

Interpretation of Laboratory Results. Straus.: Virginia Medical Monthly. Dec. 1921, 48: 513.

Laboratory results should in as far as possible be interpreted in conjunction with clinical findings. Where the laboratory shows a positive finding, it is usually fairly definite proof of the presence of disease. The great mistake, however, is to rely too much on negative findings. This particularly applies in the case of Public Health Laboratories, where there is no clinical guide for the carrying out of the tests. Many factors are instrumental in the production of negative results, for instance, in the case of throat cultures a swab may be dried out before reaching the laboratory, the diphtheria bacilli, if present, may be overgrown by less pathogenic organisms in a very septic throat, or the swab may not have been properly taken.. There should be then, full cooperation between the clinician and the laboratory worker in all cases, and especially where the separate findings are at variance.

A. .H. MACCORDICK

Alimentary Infections in Chronic Arthritis. Mutch, N.: Lancet, 2: 1266, Dec. 17, 1921.

An investigation as to the location of the primary focus in 200 cases of chronic arthritis, showed that in 34 per cent there was active sepsis in the nose and throat, in 52 per cent the teeth were affected, and in 84 per cent, streptococci of an infective type were isolated from the faeces. In many old standing cases, eradication of the infection in the mouth is of little benefit to the joint condition. The explanation is that the infection is continued in the bowel, the latter often showing active ulceration.

The majority of the infections are due to streptococci which are usually of the non haemolytic type.

The most satisfactory treatment consists in eliminating as far as possible the accessible foci and the administration of autogenous vaccines.

A. H. MACCORDICK

The Field Defects Produced by Temporal Lobe Lesions. Cushing, Harvey.: Brain., Vol. 44, part 4, 1921.

In this article is presented what would appear to be the richest contribution to the diagnosis and localization of brain tumours, appearing for some years. By reason of careful study of the fields of vision, as a result of a detailed and much perfected technique in the use of the perimeter, the author has cleared away much of the obscurity and confusion which has, hitherto, attended the diagnosis of temporal lobe lesions.

His study is based upon the anatomical knowledge that the ventral fibres of the geniculo-calcarine pathway pass far forward into the temporal lobe, as they sweep around the horn of the ventricle.

This ventral tract becomes interrupted early in the process of any pathological focus in the temporal lobe, which produces defects in the visual fields, ranging from slight quadrantic constriction to complete hemianopsia.

From a study of 59 temporal lobe tumors, 20 cases were excluded because of advancement to the degree of almost complete blindness, precluding the use of the perimeter, or because of an accompanying stupor which rendered the answer untrustworthy. Of the remaining 39 cases, 6 showed no field defect, 8 showed complete homonymous hemianopsia and 25 showed partial field defects, of varying degrees of intensity.

In the series, the perimetric findings were the most useful guide to diagnosis, not excluding the well recognized and, heretofore, the most constant symptom of temporal lobe lesions, namely, the uncinate fit. The danger of attributing the visual field defect to an occipital lobe lesion and the application of the perimetric examination in the exclusion of cerebellar lesions, are given due consideration.

FRED S. MACKAY

Some Considerations Bearing on the Diagnosis and Treatment of Dementia Praecox. White, W. A.: Psychoanalytic Review, October, 1921.

In the group of symptoms designated by Kraepelin as dementia praecox no one has as yet, White maintains, offered a satisfactory theory of the fundamental underlying process, nor will any adequate explanation be possible until all of the facts at the various levels, vegetative, neurological, psychic and social, can be brought together in a unifying synthesis.

Regression, in White's opinion, is the fundamental underlying mechanism. What underlies the regression he does not discuss, but suggests two standpoints of inquiry, first the depth of the regression measured from the point of view of the individual's personal psychological history, and second the possible inclusion in the regression process of archaic, that is phylogenetic material.

The depth of regression can be measured by the unpsychological character of the symptoms. "We are not able to feel ourselves into the position which the preacox patient occupies with relation to the world; he seems to us outside the plane of our experience. This is because his symptoms hark back to a period of which we have no recollection.

As to the inclusion of archaic material, the physical symptoms in especial fit into this concept; "segmental over-domination" of the oral zone as expressed in salivation, of the anal zone as expressed in the interest these patients display in their excretions, and other similar mechanisms.

Most suggestive of inclusion of archaic material are delusions that certain bodily excretions such as urine and faeces contain elements of the personally; delusions of food, air and sound as impregnating material; water as a birth symbol.

These infantile and primitive symbolic reactions are to be correlated with gradually increasing evidence of anatomical and functional abnormalities suggestive of defective development such as infantile genitalia, small circulatory apparatus, aspermatogenesis.

Praecox is accordingly in White's opinion a profound defect of biological adjustment. White reminds us, however, that while the prognosis of praecox is in the main unfavorable, there are many regressive conditions which are clinically indistinguishable from the early stages of praecox, and that much may be done in the way of treatment.

He does not believe that occupation therapy offers anything specific, but that the individualizing of the patient, the starting up of a flow of interest in outside activities, the socializing of his tendencies in useful occupation are all factors of the utmost importance; briefly, the effect is indirect.

The modern hospital with its occupational, vocational and industrial departments, its athletic and recreational activities, its medical, surgical and more direct types of mental therapy, and its mental hygiene social workers offers immeasurably more levels of possible adjustment (than the older hospitals), each of which may be utilized in a more or less specific way, under guidance, by the individual patient, for working out his special problems, and in which he may find the means for socializing his strivings.

In this article White discloses the analytic and synthetic trends of modern psychiatric thought. We must not be content with labelling the patient with a diagnosis, but we must study him from every point of view, anatomical, physiological, social, psychological and biological, and see what can be done for him.

A. G. MORPHY

The Influence of the Endocrines in the Psychoneuroses. Brown, W. L.: Brit. J. Psychol., October, 1921.

Brown precedes his article with a synopsis which expresses briefly and plainly his conclusions and may be read with much profit before and after the exposition of his opinions.

His principal themes are the defensive purpose of the primitive nervous system and the retention of this purpose by the sympathetic system; the close association between the latter and the endocrine glands as defensive mechanisms; the tripod of the endocrines, gonads and sympathetic system; the influence of toxic, nutritional and psychic factors on the endocrines and the reactive effect of the latter in production of psychoneurosis.

The central nervous system, he says, has had a struggle to obtain control. Man's difficulty of adaptation to his surroundings should lead the biologist to enquire whether the cells of which he is composed have always found it easy to sink their individuality in that of the organism, and the thesis of a hostile symbiosis between the tissues of the body has been upheld by Morley Roberts. Lately Trotter has developed the argument of an hostility between nervous and somatic tissues.

The sympathetic nervous system, originally evolved for rapid defensive purposes, retains primitive features of structure and functions, among the latter its lack of discriminative sensibility and the widespread and immediate character of its response.

The close alliance between it and the endocrines is well illustrated in the adrenals, the medulla of the adrenals and the post-ganglionic elements of the sympathetic being homologous structures. Functionally the sympathetic excites the secretion of adrenalin while the latter stimulates the sympathetic endings—a reciprocal action. A similar reciprocity exists between the thyroid and the sympathetic. Further, thyroid secretion quickens the whole metabolic activity of the body, and that is precisely how the sympathetic activates the body for flight or fight.

The rhythm of life depends upon the balance of the two great branches of the sympathetic system, the sympathetic proper and the parasympathetic or extended vagus. Each branch cooperates with a group of endocrine glands—the sympathetic with the adrenals thyroid and pituitary, the parasympathetic mainly with the glands of the digestive organs and their annexes.

The close association of the gonads with the endocrines and sympathetic system constitutes a tripod entrusted with the duty of the preservation of the individual and the continuity of the species, and is reflected in many psychoneuroses.

The two groups of endocrine glands and their associated nervous mechanisms are intrinsic regulators of the impetus of life. In the first few years the thymus acts as a brake. With the aid particularly of the thyroid and pituitary, active growth continues until puberty when a new equilibrium has to be found, the gonads having developed. In adult life the regulators have to provide another adjustment, and at the climacteric still another. At each of these periods the whole mechanism receives a jolt. In the last stage the accelerating thyroid gives way to the sedative parathyroid, calcium fixation goes on unchecked and the arteries become calcareous.

But at any stage the regulators may become weakened or worn out.

Bacteria and their toxins may prematurely exhaust the endocrine glands, also nervous shocks and strains through reaction of the associated sympathetic nervous system. Through interaction of these causes of endocrine exhaustion psychic conflicts may result from defective adjustment of environment.

Reasoning from the known effects of fever on the endocrine glands, Brown proceeds to discuss the effect of climate, alluding to the close ties between the skin, sympathetic system and endocrines.

All the endocrines, he says, are affected alike by toxic, nutritional and psychic factors.

Under the nutritional factor he cites pellagra as a striking example of a deficiency disease producing actual structural changes in the adrenals and sympathetic ganglia and leading to mental deterioration.

Under the emotional factor, repression of emotions arising from conflict of the instincts of self preservation, reproduction and gregariousness, may show itself at any of the three great levels of the nervous system, at the psychic level as a phobia or obsession, at the sensorimotor as a paralysis, or at the sympathetic level in some cardiac or digestive neurosis or in some endocrine disease.

Dissociated action of the sympathetic system is exhibited in emotional glycosuria. "When stocks go down in New York, says Crile, diabetes goes up." Two cases have been cited in which glycosuria and mental symptoms alternated, as if the emotional discharge asserted itself either at the metabolic or the psychic level, but not at both.

In Graves' disease Brown contends that there is always an underlying sympathetic irritation producing hyperthyroidism; this in turn increases the sympathetic response, and so a vicious circle is formed. Once the thyroid has been started on this evil course through sympathetic stimulation, e.g. through fear, as instanced in the London air-raids, the emotional agitation is kept up at such a level that psychoneuroses are the rule and insanity far from common.

A. G. MORPHY

Epileptiform Manifestations in Endocrinous Disorders. Leahy, S. R.: New York State J. M., January, 1922.

In this article Leahy reports seven cases, giving details of physical examinations, Roentgen findings, blood sugar tests, menstruation, with their bearing on endocrine dysfunction. There appeared to be a definite relation between ovarian secretion and epileptiform attacks, and between the latter and dyspytoitarism with deficient secretion.

Practically all the cases showed more than one glandular involvment. A. G. MORPHY

Some Therapeutic Suggestions in the Modern Treatment of Epilepsy. Clark, L. P.: New York State J. M., January 1922.

According to Clark, epilepsy must be studied from the biological standpoint, and is to be regarded as a defective adjustment of the individual to his environment.

Epilepsy is organic, he says, not in the sense of a definite and specific lesion of the cortex, but in the sense of being a widespread impairment and deterioration of the psyche as a whole, and is ultra-microscopic.

An enumeration of physical defects will not suffice to reveal the real nature of epilepsy, as similar defects are found in individuals otherwise normal. The fit episode Clark considers to be a mentally regressive symptom, that is, the attack breaks off the conscious demand and allows the psyche or intimate unconscious activity to concern itself with those things that the individual experienced in earliest life. This, he maintains, is proved by studies of twilight states and dreams.

Modern treatment, then, is based on these conceptions. The environment is modified to the individual as far as possible, stress and strain being removed, and conscious and unconscious motives are requisitioned in the training.

The article is suggestive and stimulating even though one may not be prepared to accept Clark's principals as proven. A. G. MORPHY

DERMATOLOGY

Two Cases of Exudative Erythema Associated with Malignant Disease of the Uterus. Haldin, Davis: Brit. J. Derm. & Syph. Jan. 1922.

Two of his cases showed marked erythematous changes in the skin in association with pathological conditions in the pelvis, and in one the cutaneous eruption disappeared with successful treatment of the main condition.

With these cases in view, the writer reviews the present state of our knowledge regarding such associated conditions grouping them under, the influence of menstruation, of pregnancy, and of certain morbid conditions of the pelvic organs.

The facts have been mainly collected by J. D. Bulkeley and published in 1906.

Acne and eczema are the two dermatoses chiefly connected with menstruation. Herpes also is frequently coincident, and a few cases of ecchymoses and purpuric eruptions are reported.

The most characteristic dermatosis associated with pregnancy is hydroa gestationis in which there occur patches of exudative erythema surmounted by vesicles. There is great irritation. Urticaria, rosacea and eczema are also found. Very few cases apparently are reported of skin eruptions associated with uterine or ovarian tumours. H. E. MACDERMOTT

Phenolphthalein Eruptions. Wise, F. and Abramovitz, E. W., Arch. Derm, & Syph., March, 1922.

Eruptions due to taking phenolphthalein have apparently only been recognized since 1918, when five cases of persistent erythema multiforme with pigmentation were reported by Abramovitz, and eventually were proved to be due to phenolphthalein.

Since then several other cases of the kind have been reported.

The skin and mucous membrane reactions are apparently similar to those produced by antipyrin. There is a persistent multiform erythema, relapsing in course leaving a yellowish brown pigment deposit in the skin. Itching may be severe, and ulceration may occur, especially in the mucous membranes. Further ingestion of the drug may cause a temporary retrogression of the rash.

There is a similarity to the eruptions caused by arsphenamin, but there is lacking the multiform character and the persistence of pigmentation.

Ingestion of the drug usually causes a breaking out of the rash in the same areas as were originally affected.

The authors bring out the fact that such laxatives as ex-lac, phenolax, partola and analax may be responsible for the eruption in susceptible patients, due to their phenolphthalein content. H. E. MACDERMOTT

News Items

ONTARIO

THE PRELIMINARY PROGRAMME FOR THE FORTY-SECOND ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION, TO BE HELD IN TORONTO, ON May 30, 31, June 1 & 2, 1922.

With an open session in Convocation Hall on the evening of Monday, May 29th, at which Dr. Macfie Campbell of Boston will give an address on "The Modern Conception of Mental Disease." This meeting is open to the public. Come yourself, and invite any of your friends who are interested. It is sincerely hoped that there will be a large attendance.

GENERAL NOTES REGARDING THE MEETING

Dress. Informal on all occasions.

Plans are now fairly well completed for the forthcoming Annual Meeting. The University authorities have very kindly placed at our disposal University College Building, which will be the headquarters of the convention and will provide accommodation for all the sections.

Members will have the privileges of Hart House, with the exception of meals, which will not be available there.

The Committee on Arrangements reports splendid accommodation available for out of town guests for both lodging and meals. Rates will be reasonable and the allocations are within easy walking distance of University College. Information will be available at the Registration Office.

Bring along your golf clubs and tennis racquets. The Committee on Entertainment will gladly arrange to put you up where your favourite pastime may be enjoyed.

Have your mail, telegrams and long distance messages addressed in care of the Secretary of the Ontario Medical Association, University College, Toronto. A special clerk will be detailed for this work.

Information regarding the parking of cars will be available at the Registration Office.

Green Cross Markers will be available for all motorists. Members are urged to put them up and thus identify themselves among their colleagues

You are cordially invited, while at the meeting, to visit the Royal Ontario Museum on Bloor Street West, where a most pleasant hour may be enjoyed.

X-Ray View Boxes will be installed in the Radiological Section. If you have an interesting plate which you would like others to see, bring it along to the meeting.

The Section on Pathology and Clinical Laboratory Methods announces something new for this meeting. You will be interested in carefully reading an outline of their programme.

The value and success of the meeting can be greatly enhanced if every member looks over the subjects to be presented, chooses one or more in which he is particularly interested, and comes to the meeting prepared to enter into the discussion.

Thursday Evening has been left open for Class Reunions and private entertainment. The Secretary will be glad to render any assistance to classes desiring to get together on that occasion.

The Round Table Dinner to be held at the Academy of Medicine on Tuesday, May 30th, followed by the Round Table Discussion, is open to all members of the Association. The price of the Dinner is fixed at $2.00. Plates will be set for those who signify their intention to be present. If you cannot possibly attend the dinner, join us later in the evening when all present will be given an opportunity to take part in the discussion on the reports of the Committee of Interrelations and Pharmacy.

The first issue of our Bulletin already mailed you provides a return Post Card which you are urged to use.

The Association Dinner, to which the ladies are invited, will be held at the King Edward Hotel at 7:00 P.M. on Wednesday, May 31st, and will be followed by the Presidential Address.

The Association and its friends are to be the guests of Dr. and Mrs. Herbert Bruce at a Garden Party to be held at their home at 4:30 P.M. on Thursday, June 1st.

The members of the Committee in charge of the Annual Meeting (whose names are herewith presented) and the Fellows of the Academy of Medicine, Toronto, under whose auspices we meet this year, will be glad to do all in their power to make your time interesting and profitable while at the meeting. Do not hesitate to ask them about anything upon which you think they can be of service.

Write the Secretary for information about any point which you do not find explained in this Preliminary Programme.

PROGRAMME

Note:—All meetings to be held in University College unless otherwise specified.

Monday, May 29th

8.30 p.m.—Convocation Hall, Dr. Macfie Campbell, Boston; Subject, " The Modern Conception of Mental Disease."

Tuesday, May 30th

10.00 a.m.—Meeting of Directors.

11.00 a.m.—Meeting of Committee on General Purposes, which, with adjournment for luncheon, will continue throughout the afternoon.

6.30 p.m.—Round Table Dinner at Academy of Medicine.

8.00 p.m.—Round Table Discussion.

Wednesday, May 31st

9.00 a.m.—Registration.

10.00 a.m.—Business Session of the Association.

11.00 a.m.—Address—Dr. Krause, Johns Hopkins, Baltimore, on "Tuberculosis."

12.00 noon—Address—Dr. Peterson, on a Gynaecological subject.

1.00 p.m.—Adjournment for Luncheon.

2.00 p.m.—Sectional Meetings.

7.00 p.m.—Association Dinner, King Edward Hotel. Ladies invited.
Presidential Address—Dr. F. J. Farley, Trenton.

Thursday, June 1st

9.00 a.m.—Sectional Meetings.

11.30 a.m.—Address in Medicine—Dr. Thos. Macrae, Philadelphia.

1.00 p.m.—Adjournment for Luncheon.

2.00 p.m.—Sectional Meetings.

4.30 p.m.—Garden Party, the guests of Dr. and Mrs. Herbert A. Bruce.

Friday June 2nd

9.00 a.m.—Sectional Meetings.

11.30 a.m.—Address in Surgery—Dr. Neil J. McLean, Winnipeg.

1.00 p.m.—Adjournment for Luncheon.

2.00 p.m.—Sectional Meetings.

SECTIONAL PROGRAMME

EYE, EAR, NOSE AND THROAT

Wednesday, May 31st, 2.00 p.m.

A Consideration of the Various Problems Presented by Haemorrhages Occurring in Connection with Operations on the Tonsils. Dr. Perry Goldsmith, Toronto.

Some Observations on Throat Conditions in Children. Dr. E. Boyd, Toronto.

Paper by Dr. D. J. Gibb Wishart, Toronto.

Thursday June 1st, 2.00 p.m.

Combined Meeting with Section of Radiology.

The Use of the Epidermic Graft in Plastic Eye Surgery. Dr. John M. Wheeler, New York.

The Smith Cataract Operation. Dr. R. J. P McCulloch, Toronto.

MEDICINE

Wednesday, May 31st, 2.00 p.m.

Clinics—Toronto General Hospital—Lecture Room.

Clinic—General Medicine. Dr. A. McPhedran, Toronto.

Clinic—Neurology Dr. Foster Kennedy, New York City.

Thursday, June 1st, 9.00 a.m.

Paper by Dr. Robert Mann, Toronto.

Quinidin in Cardiac Disease. Dr. Ross Jamieson, Toronto.

Demonstration of Skin Diseases. Dr. Philip Burnett,Montreal; Dr. D. King Smith, Toronto; Dr. Emerson J. Trow, Toronto; Dr. H. A. Dixon, Toronto.

Thursday, June 1st, 2.00 p.m.

Clinic—St. Michael's Hospital. Dr. C. F. Martin, Montreal; Dr. Charles Hunter, Winnipeg.

Friday, June 2nd, 9.00 a.m.

Combined Meeting with the Section of Pathology—Pathological Building, University of Toronto.

Friday, June 2nd, 2.00 p.m.

Combined Meeting with the Section of Surgery.

Symposium on Empyema and Abscess of the Lung

Bacteriology and Pathology. Dr. James Miller, Kingston.

X-Ray Findings. Dr. L. R. Hess, Hamilton.

Diagnosis. Dr. W. S. Lemon, Mayo Clinic' Rochester.

Treatment:—

(a) Medical. Dr. Jabez H. Elliott, Toronto.

(b) Surgical. Dr. F. B. Mowbray, Hamilton.

Discussion to be opened by Dr. George Strathy, Toronto.

OBSTETRICS AND GYNÆCOLOGY

Wednesday, May 31st, 2.00 p.m.

Ectopic Pregnancy. Dr. W. B. Hendry, Toronto.

Indications for Hysterectomy. Dr. D'Arcy Frawley, Toronto.

Methods of Resuscitation of the New Born. Dr. G. G. Copeland, Toronto.

Thursday, June 1st, 9.00 a.m.

The Teaching of Obstetrics and Gynaecology. Dr. B. P. Watson, Toronto.

Surgical Treatment of Chronic Inflammation of the Uterine Adnexa. Dr. C. H. Gilmour, Toronto.

Thursday, June 1st, 2.00 p.m.

Treatment of Contracted Pelvis of Minor Degree. Dr. J. A. Kinnear, Toronto.

Pernicious Vomiting of Pregnancy. Dr. V. J· Harding, Toronto.

Friday, June 2nd, 9.00 a.m.

Combined Meeting with the section of Pathology, Pathological Building, University of Toronto.

Friday, June 2nd, 2.00 p.m.

Value of X-Ray in Gynaecology. Dr. G. E. Richards, Toronto.

PÆDIATRICS

Wednesday, May 31st, 2.00 p.m.

The Value of Supplemental Feeding in Gastro-Intestinal Disturbances of the Breast-Fed Infant. Dr. R. R. McGregor, Kingston.

Acrodynia—Report of three cases in rural practice. Dr. A. F. McKenzie, Alliston.

Meningeal Haemorrhage of the New Born. Dr. Alan Brown, Toronto.

The Classification and Treatment of Cardiac Disease in Children, based on exercise tolerance.

Dr. George Smith, Toronto.

Thursday, June 1st, 2.00 p.m.

(At Hospital for Sick Children)

Presentation of Clinical Cases.

The Technique of Standard Psychological Tests. Miss J. Louden.

Congenital Cardiac Malformations. Dr. A. P. Hart, Toronto.

The Cause and Management of Malnutrition in Children. Dr. Chas. S. MacDougall, Toronto

Friday, June 2nd, 9.00 a.m.

The Management of Otitis Media in Infancy and Childhood. Dr. Edmund Boyd, Toronto.

Hernias in Infancy. Dr. W. E. Gallie, Toronto.

Congenital Syphilis. Dr. Edward A. Morgan, Toronto; Dr. Geo. Campbell, Ottawa.

PATHOLOGY AND CLINICAL LABORATORY METHODS

Friday, June 2nd, 9.00 a.m.

Pathological Building, University of Toronto

Friday morning has been set aside for a practical demonstration of the various clinical laboratory methods that might be of interest and use to the general practitioner. Each demonstration will be preceded by a five minute talk in which the principle and clinical application of the test will be explained.

1 Professor Harding of the Department of Pathological Chemistry, University of Toronto, will demonstrate the Laboratory Control of the treatment of nausea and vomiting in pregnancy by the use of carbohydrates.

2. Dr. W. R. Campbell and Dr. A. A. Fletcher of the Department of Medicine will demonstrate and discuss the principles of Basal Metabolism and the non-protein-nitrogen and blood creatinine estimation in cases of renal disease. They will also slow the method for estimating blood sugar and the significance of lowered tolerance in certain cases of chronic arthritis, diabetes, etc.

3. Dr. H. K. Detweiler and Dr. W. Ray Hodge of the Department of Medicine, will give a brief resume of the principles of the Wassermann reaction and demonstrate the appearances and significance of strongly positive, negative, and weakly positive tests, and the results of treatment. They will also demonstrate the methods of diagnosis of the various protein sensitizations in bronchial asthma and hay fever, and will give any one an opportunity of asking any questions on these problems.

4. Dr. H. B. Maitland and Dr. Gordon C. Cameron of the Department of Bacteriology will demonstrate the principle and the importance of the Rosenow blood culture in cases of sub-acute bacterial endocarditis and the types of organisms causing these lesions.

5. Dr. Magner, Pathologist of St. Michael's Hospital, Toronto, will show how vaccines are made and discuss their clinical value.

6. Dr. Isaac Erb, Pathologist of the Sick Children's Hospital, will demonstrate a simple method for blood grouping for transfusion.

7. Dr. G. S. Strathy of the Out Patients' Department of Medicine will demonstrate the proper technique for estimating blood pressure.

8. Dr. R. W Naylor, will show practical methods for identifying the Spirochetae Pallida by dark field illumination and by stained smears.

9 Demonstrations in the technique of red and white blood counts and spinal fluid cell count will be given by Dr. G. W. Lougheed and Dr. Ambrose Moffat.

The technique for making rapid frozen sections of fresh tissues, as well as for making paraffin sections will also be shown.

There will also be an exhibit of interesting pathological museum specimens.

RADIOLOGY

Tuesday, May 30th, 2.30 p.m.

Symposium, Diseases of Bone

(a) Children. Dr. A. H. Rolph, Toronto.

(b) Adults. Dr. Geo. McNeill, London.

Discussion opened by Drs. Ritchie, Stone and Stewart Wright.

Wednesday, May 31st, 2.00 p.m.

Symposium, Lesions of the Intestinal Tract

(a) Oesophagus. Dr. E. E. Cleaver, Toronto.

(b) Perigastric Lesions. Dr. W. H. Dickson, Toronto.

(c) Colon. Dr. L. R. Hess, Hamilton.

Discussion will be opened by Drs. H. B. Anderson, Toronto, F. C. Neal, Peterborough, and Dr. H. A. Boyce, Kingston.

Thursday, June 1st

9.30 a.m.—(a) Peribronchial Tuberculosis. Dr. Kennon Dunham, Cincinnati.

(b) Non-Tuberculous Disease of the Lung. Dr. J. H. Elliott, Toronto. Discussion will be opened by Drs. Parfitt, Dobbie, Richards, Caulfield and Hopkins.

(c) Business Session of the Ontario Radiological Society.

2.00 p.m.—Recent Advances in X-Ray Therapy. Dr. Harvey R. Gaylord, Buffalo. Note.—This will be a joint session with the Eye, Ear, Nose and Throat Section.

3.00 p.m.—Recent Developments in Deep Therapy.

7.30 p.m.—Dinner at the Academy of Medicine for members of the Onta io Radiological Society and guests.

8.30 p.m.—Lantern Slide Demonstration and presentation of case reports with plates.

Friday, June 2nd

9.00 a.m.—Radium and Dermatology. Dr. F. C. Harrison, Toronto.

9.45 a.m.—Radium Therapy in Diseases of Women. Dr. W. H. B. Aikins, Toronto.

10.30 a.m.—Paper by Dr. G. E. Richards, Toronto. Subject announced later.

Note.—All members of the Ontario Radiological Society are reminded that illuminating boxes will be present for demonstrating slides and plates.

SURGERY

Wednesday, May 31st, 2.00 p.m.

An Analysis of Work on Gall Bladder Diagnosis. Dr. W. J. Macdonald, St. Catharines.

Paper by Dr. C. E. Spence, Fort William. Subject to be announced later.

Living Sutures, A Clinical Demonstration. Dr. W. E. Gallie, Toronto.

Heliotherapy in Surgical Tuberculosis. Dr. R. I. Harris, Toronto.

Thursday, June 1st, 9.00 a.m.

Treatment of Fractures of the Femur, a clinical Demonstration. Dr. A. B. LeMesurier, Toronto.

Post-operative Management. Dr. R. V. B. Shier, Toronto.

The Use and the Abuse of the Cystoscope. Dr. Charles Hair, Toronto.

Treatment of Empyema, with special reference to negative pressure. Dr. Bruce Robertson, Toronto.

Thursday, June 1st, 2.00 p.m.

Surgical Lesions of the Pylorus and Duodenum. Dr. Herbert B. Moffatt, Ottawa.

The Symptoms of Acute Osteomyelitis. Dr. D. E. Robertson, Toronto.

The Surgical Aspect of Gastric and Duodenal Ulcer. Dr. Roscoe Graham, Toronto.

Friday, June 2nd, 9.00 a.m.

Combined Meeting with Section of Pathology, Pathological Building, University of Toronto.

Friday, June 2nd, 2.00 p.m.

Combined Meeting with Section of Medicine.

The Medical Council of Canada announces their examinations for June 13th at Toronto, Winnipeg and Vancouver. Forms can be had from Dr. R. W. Powell, Registrar, 180 Cooper Street, Ottawa.

Peterborough Medical Society met on March 2nd. Dr. L. R. Hess of Hamilton discussed "The Interpretation of X-Ray findings in the Gastro-Intestinal Tract."

Oxford County Medical Society met on February 24th and was addressed by Dr. H. K. Detweiler of Toronto on the subject, "Asthma and Hay Fever"; and by Dr. F. W. Marlow of Toronto on "Pelvic Inflammation."

Niagara District Medical Association was addressed by Dr. Andrew Hunter of Toronto on the subject "Acidosis" on March 23rd. An interested audience took an active part in the discussion which followed Dr. Hunter's presentation.

Perth County Medical Society met in Stratford on March 13th. Dr. L. R. Hess of Hamilton presented the subject "The X-Ray Diagnosis of Gastro-Intestinal Conditions," illustrating his address with lantern slides. An interesting and active discussion followed.

Sault Ste. Marie Medical Society met on March 11th and were addressed by Professor C. L. Starr of Toronto on the subject, "Acute Abdominal Conditions of Childhood." In the afternoon, a clinic was given at the hospital, with a discussion of X-Ray plates and findings.

Stormont and Glengarry Medical Society met at Cornwall on March 22nd in the Hotel Dieu. The meeting was addressed by Dr. Gwyn on the subject of "The Heart in General Practice including cardiac irregularities."

At a meeting of the Hamilton Medical Society on March 17th, Dr. Gwyn of Toronto took up the question of the diagnosis and treatment of pneumonia and its complications, illustrating his talk with lantern slides of some of the interesting lung conditions, and with charts and records showing the influence of the serum treatment and other methods of treatment in pneumonia.

Hamilton Medical Society met on March 22nd, 1922. Dr. L. J. Austin of Kingston presented an outline of "The Pathology, diagnosis and treatment of genito-urinary tuberculosis, with special reference to the kidney." Dr. Austin's remarks indicated that tuberculosis of the kidney is a relatively common disease. The only certain diagnosis was in the finding of the organism and he urged that early nephrectomy be done in every case that was proven to be unilateral.

The Rosedale Presbyterian Church Hospital Circle announces the gift of a Hospital Unit to be established at Matheson, Ontario, early in April. The Unit will be staffed by Miss Annie E. Chambers and Miss Annie Maitland as Superintendent and Assistant Superintendent respectively. The purpose of the Unit is to supply nursing and community service in the Matheson District adjacent to the Kirkland Lake District.

The Ontario Journal of Neuro-Pyschiatry published and issued by the Department of the Provincial Secretary of the Province of Ontario appeared last month. It contains a valuable collection of papers and addresses of special interest to those interested in neuro-psychiatry. The need of a Journal of this sort was never greater and, if it will lead to a readjustment in our medical curricula where the question of the knowledge of insanity and its treatment is concerned, should be enthusiastically welcomed.

The Third Annual Banquet of the Harvey Club of London, Canada, took place on February 22nd, 1922. An address on William Harvey and his scholarly attainments was given at the dinner by President Crane. Other addresses followed. The interesting bulletin of the Harvey Society with its case reports is becoming a feature of Canadian Medical Journalism. With the permission of the editors, reproduction of some of their case reports is carried out from time to time in this Journal.

The Western Ontario Academy of Medicine gave the following comprehensive programme on March 24th in London. A general session at 2:00 P.M. addressed by Dr. R. D. Rudolf of Toronto on "The use of cardiac stimulants in the treatment of disease." Address by Dr. Clifford G. Grulee of Rush Medical College of Chicago on "The institution and termination of breast feeding." This was followed by a pediatric clinic. At 5:00 P.M. Professor J. P. McMurrich of the University of Toronto gave an address on "Vesalius and his predecessors." Luncheon at the Tecumseh House at 12:30 preceded the programme.

"Osler Night" Tuesday, April 4th, at the Academy of Medicine, Toronto was celebrated with the following programme:—Dedication of the new auditorium as the Osler Hall, by Ven. Archdeacon Cody. Presentation of a portrait of Sir Wm. Osler, a copy of the celebrated Sargent portrait at Johns Hopkins, by Mr. Alexander R. James, deputed by Mr. Sargent, was made by his Honour the Lieutenant Governor for Sir Edmund Osler. Short addresses were made by Osler students upon the following lines:— 1 Influences bearing on a great career, N. B. Gwyn; 2 Osler from the standpoint of the House Physician, Harold Parsons; 3 Osler from the standpoint of the Undergraduate, D. J. Gibb Wishart; 4 Osler as an Incentive, C. D. Parfitt; 5 The Academy's debt and tribute to the memory of Sir Wm. Osler, H. B. Anderson.

Thunder Bay Medical Society met on Saturday, March 18th. The morning was given up to informal talks on Drugs in the McKellar Hospital, Fort William. After lunch at the Kam Club, Dr. V. E. Henderson of Toronto gave an address on "The Action of Drugs on the Heart." In the evening there was a discussion on "The Modern Ways of Using Drugs in the Treatment of. Disease." This was given at St. Joseph's Hospital. There was a good attendance at the demonstrations and lectures, and active discussions added to the interest of the meetings

LOCUM TENENS

Dr. A. H. Cameron Smith, South Porcupine, is asking for an assistant for the summer—some one prepared to do camp and mine work. Must be qualified, or at least about to be qualified, at the first Council Examinations.

HAMILTON LETTER

In view of the fact that a vacancy had arisen in Electoral Division No. 7, of the College of Physicians and Surgeons of Ontario, as the result of the death of the late Dr. H. S. Griffin, the Electors of that Division were notified by the College that nominations would be received up to February 27th. In the absence of other machinery, a number of the Electors of this Division undertook the responsibility of calling a Convention in the hope that such would give a desirable opportunity for a free discussion of College affairs. This Convention was held in the Royal Connaught Hotel in Hamilton on February 15th. Various members of the profession gave short addresses. The Convention agreed that some machinery should be created by the College for calling a Convention in each Territorial Division during the month preceding the regular Annual Meeting of the Council, in order that in such Conventions, an opportunity would be given the whole Electorate to discuss all matters over which the College has control, and more or less definitely instruct their representatives. The Convention also agreed that the Nominating paper of any candidate for Election should merely indicate that the nominee had agreed to stand for election, and that the name of two members of the profession in such Division should be sufficient for nomination The Convention further agreed that it would be desirable that the vote for representatives in each Division should be by secret ballot and that when three or more candidates are nominated the Election Ballot should provide for "the single transferrable vote" as recommended by the advocates of proportional representation Resolutions covering these various points were duly carried and the acting secretary was instructed to forward these to the Candidate elected. Dr. George S. Rennie promised if elected, to call a Meeting of the Electors within this Division as referred to above. It is to be hoped that similar action will be taken by other representatives in the various Divisions in the Province, and that every possible effort will be made to persuade the members of the profession to take an active interest in the discussion of the various problems, which not only concern the profession, but the public at large.

BRITISH COLUMBIA

Dr. T. E. P. Gocher has been elected president of the North Vancouver Army and Navy veterans.

At a luncheon on March 16th, Dr. J. A. Gillespie dealt with the drug evils and their menace.

Dr. Mullin of Vancouver was re-elected chairman of the public health bureau of the Board of Trade of Vancouver.

Dr. John Nay of Trail, B. C. has been appointed assistant medical advisor to the Workmen's Compensation Board.

The Public Health Campaign in British Columbia, inaugurated by the B. C. Medical Association, commenced on March 20th.

In the larger cities, Vancouver and Victoria, Public Health meetings were held each evening for five consecutive days, whilst in the smaller cities, Nanaimo and New Westminster, one meeting is being held each week. Owing to the bad roads it was found impossible to hold meetings simultaneously in the Interior and arrangements are therefore being made to hold these, commencing the first week in May.

In Vancouver five halls were engaged for each of the five nights. One of the following subjects was given each night:—Cancer, Tuberculosis, Venereal Disease, Preventive Medicine, Milk. Each subject was divided into three sections, a different doctor being in charge of each section. In this way no less than 75 medical men were speaking in Vancouver during the week.

The same arrangement was made in Victoria with the exception that only one hall was used each night, which involved 15 different speakers during the week.

This campaign has been heartily endorsed by all public organizations and the press. The Board of Trade provided Chairmen for the meetings; Service Clubs including the Canadian, Gyro, Rotary and Kiwanis, had each a medical man speaking at their weekly luncheons, and the evident desire of the public to know more about the prevention of disease from the fully qualified medical man was manifested by the excellent attendances at the meetings. Press editorials and news reports were most gratifying.

One important result from this campaign will be a closer co-operation between the Provincial Health Officer and the medical profession. In future, through the British Columbia Medical Association, it will be possible to place at the disposal of the Provincial Health Officer, a speaker on any health subject of public interest, at any time, or place.

The regular monthly meeting of the Vancouver Medical Association was held on March 13th when Dr A H. Spohn read a paper on "Infantile Eczema and its Relation to Food Metabolism." A clinical meeting of the same society was held on the 28th of the month at which a case of Actinomycosis of the face was presented by Dr. T R. B. Nelles; a specimen of extra-tubal pregnancy was shown by Dr. D. Lineham; a report on several cases of transfusion giving statistics and results was presented by Dr. J Thomson and a case of toxic goitre with remarks on treatment and statistics by Dr. Alison Cumming.

GENERAL

Copy of letter sent to Medical Societies of Canada.

The Canadian Radiological Society begs to announce to the profession of Canada that the Society has established a Consultation Bureau where any and all questions pertaining to X-Ray and Radium may be submitted for information, suggestions, or advice. This is being done cheerfully and entirely without charge, and with no mercenary motive. One of the chief objects of the Society is the maintaining of a thoroughly ethical standard in this special branch of medicine in Canada.

The Society is also desirous of securing a complete list of all persons within the Dominion of Canada who are actually engaged in the medical application of X-Ray or Radium, or who are interested in this branch in a scientific manner. Membership in the Society is available to physicians who are specialists in this department, and an associate membership is available to others of scientific attainment who are interested in this particular branch. Provision is also made for technicians. Application for membership or information should be made to the Secretary.

The next annual Convention of the Society is being held in conjunction with the Canadian Medical Association Convention in Winnipeg, June 20-23rd.

L. K. Poyntz, *Secretary-Treasurer*,
Victoria, B.C.

ANNOUNCEMENT OF THE MEDICAL FELLOWSHIPS BY THE NATIONAL RESEARCH COUNCIL OF THE UNITED STATES

The National Research Council announces the establishment of Fellowships in Medicine created for the purpose of increasing the supply of thoroughly qualified teachers in medicine in both clinical and laboratory subjects and in both curative and preventive aspects. The fellowships are supported by appropriations of the Rockefeller Foundation and the General Education Board amounting in total to One Hundred Thousand ($100,000) a year for a period of five years. Those receiving awards will be known as Fellows in Medicine of the National Research Council. To qualify for appointment as a fellow, a candidate must have the degree of Doctor of Medicine or Doctor of Philosophy from an approved university, or preparation equivalent to that represented by one of these degrees. Only citizens of the United States or Canada will ordinarily be appointed, although the fellowship board is authorized to set aside this provision in exceptional cases. The fellowships will be open to both sexes. Since the principal purpose of establishing these fellowships is to increase the number of competent teachers in the field of medicine, each incumbent will be required to gain experience in teaching. As creative work is regarded as essential to the best teaching, emphasis will also be placed upon research. Fellows will be at liberty to choose the institutions or universities in which they will work, as well as the men under whose direction they will carry on their researches, subject to the approval of the fellowship board. Appointments are to be made for a period of twelve months, beginning at any time in the year, with an allowance of six weeks for vacation. The time may be extended, however, if in the judgment of the board the work which the fellow has done justifies it. The stipends are not definitely fixed in amount; but they are intended to enable the individual to live comfortably while carrying on his special work as a fellow. The fellowships will be administered by a special committee, known as the Medical Fellowship Board of the National Research Council. Correspondence concerning the fellowships should be addressed to the Division of Medical Sciences, National Research Council, Washington, D.C.

Obituary

Dr. T. W. Simpson, one of Napanee's oldest physicians died of pneumonia on March 15th. An active practitioner, he had also served the town as Mayor and Councillor for several years.

Book Reviews

Collected Papers on the Psychology of Phantasy. Dr. Constance E. Long. London, Balliere, Tindall and Cox.

This book consists of a series of chapters dealing mainly with the Psychology of Children. The weakness in the volume is that each was originally published as a separate entity and as a result there is much needless repitition of the same material.

The subconscious mental working of the child's mind is taken up under several headings and there are very many excellent and interesting cases described throughout the volume, with the usual danger of the deductions being the viewpoint of the observer rather than the definite truth. Dreams are well discussed and there is fortunately a lack of the Freud sexual terminations to each problem under consideration.

The book exhibits the return to more healthy psycho analytic conclusions among the British Freudians although the main viewpoints of Psychic activity are parallel to the original plan. The book will interest the person already versed in these subjects but on account of the voluminous description of what could have been discussed in a much smaller volume, it is not suitable for a casual or less accustomed reader.

Essentials of Laboratory Diagnosis. Francis Ashley Faught. Seventh revised and enlarged edition. F. A. Davis Co., Publishers, Philadelphia. Price, $4.50, net.

This book designed for students and practitioners contains upwards of 500 pages. It treats of laboratory procedures from care of the microscope to complex methods of serology. There are 14 sections, dealing with the subjects of sputum and blood examination, blood chemistry, biochemistry, animal parasites, bacteriological methods and serology; with an appendix on the preparation of stains and reagents and miscellaneous data. Much of the information is valuable and in a useful form; much on the other hand is too brief. The author has incorporated methods which have been superseded by newer and more accurate procedures, and others which have not withstood critical analysis.

The City That Was. Stephen Smith, A.M., M.D., LL.D. Founder and First President American Public Health Association. Frank Allaben, 3 West 42nd St. New York. Octavo, pp. 211. Souvenir Edition. Issued at Semi-Centennial meeting of the American Public Health Association. 1921 (Copyright 1911)

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Of great interest as coming from the oldest public health man now living—oldest in years as well as oldest in service—this volume vividly recounts unsanitary conditions in New York City in the bad old days and how they were reformed. All but unbelievable now in the telling were these conditions, yet (so great are the effects of usage and habit) commonplace, perhaps proper, possibly even a matter of pride to the then citizen of those days. "From 1622 to 1886, a period of two hundred and forty-four years the land was practically undrained; the drinking water was from shallow wells, befouled by street, stable, privy, and other filth; there were no adequate sewers to remove the accumulating waste; the streets were the receptacles of garbage; offensive trades were located among the dwellings. In dark, unventilated, uninhabitable structures these wretched people were herded together, in cellars and garrets, as well as in the body of the building, until New York had the largest population to a square acre of any civilized city. Smallpox, scarlet fever, measles, diphtheria were domestic pestilences with which the people were so familiar that they regarded them as necessary features of childhood. Malaria fevers every autumn, consumption continually, typhus and typhoid, Asiatic cholera and sometimes yellow fever attacked the citizens. Even so late as the five years preceding 1866 the death rate was 38 per thousand compared with 12 to-day.

Into this 500,000 population, reeking with disease, politics, graft, inhumanity, greed and vice in every form a small group of medical reformers, a legal altruist and a few laymen plunged their undaunted way.

The story as told with great vigour by Dr. Smith is indeed an epic, and should be read for its heroic qualities, its clear recital of great deeds well done, its boldness and its fire. True enough the whole book is an apotheosis of the now discarded filth theory of disease in its most developed form. True enough that the theories on which these great men acted were all wrong and that their results were obtained indirectly and as a side issue of that which they themselves then regarded as their chief assault upon the main objective of their campaign. The search for the philosopher's stone was also a misdirected campaign which nevertheless gave us high returns—modern Chemistry—and all its tremendous advances, for instance. This error in theory detracts no whit from the example in practice set to us of to-day: with our far greater knowledge we lack the courage and energy of these old giants, the pioneers who blindly bruised their floundering way to—modern civilization!

Dr. Smith's name will therefore long remain a glowing torch in the darkness of the past—an inspiration of the highest for the future for we cannot read this account, (and every medical and public health man of to-day should read it) without a quickened pulse and a glow of exaltation, all but envious; notwithstanding that one has also a heart-breaking stab of admiring pity for the pathos of it—the pathos of noble effort, misdirected even though triumphant; winning—but winning by mistake!

Quoting poetry is often a mere space-filling device yet irresistibly the receiver of this book turns to poetry for adequate expression of its values.

"Wonderful little when all is said
Wonderful little our fathers knew
Half of their remedies cured you dead
Most of their teaching was quite untrue.

* * * * *

We are afflicted by what we can prove
We are distracted by what we know
So—ah So!
Down from your heaven or up from your mould
Send us the hearts of our fathers of old!

Kipling—"Rewards and Fairies"

H. W. H.

Books Received

Abdominal Pain—By Professor Dr. Norbert Ortner, Chief of the Second Medical Clinic at the University of Vienna. Authorized Translation by William A. Brams, M.D. Published by Rebman Company, New York, 1922. May be obtained from the MacMillan Company, St. Martin's House, Toronto.

Basal Metabolism: Its Determination and Application—By Frank B. Sanborn, Editor. First Edition. 280 pages, 60 illustrations, 25 tables. Published by Sanborn Company, Boston, Mass., 1922. Price $6.00 net.

International Clinics—A quarterly of illustrated clinical lectures and especially prepared original articles on Treatment, medicine, surgery, neurology, pædiatrics, obstetrics, gynæcology, orthopædics, pathology, dermatology, ophthalmology, otology, rhinology, laryngology, hygiene, and other topics of interest to students and practitioners, by leading members of the medical profession throughout the world. Edited by H. R. M Landis, M.D., Philadelphia, with the collaboration of Chas. H. Mayo, M D., Rochester. Volume I, thirty second series, 1922. Published by J. B. Lippincott Company, Philadelphia.

Diagnostic, Traitement et Expertise des Sequelles Oto-Rhino-Laryngologiques—Par le Dr. Jean Guisez; avec 115 figures dans le texte. Published by Librairie J B. Bailliere et Fils, 19 Rue Hautefeuille, Paris, 1921

Nutrition and Growth in Children—By William R. P. Emerson, A.B., M.D., 324 pages with 18 illustrations and a number of charts. Published by D. Appleton and Co., New York and London, 1922.

An Essay on Physiology of Mind—By Francis X. Dercum, M.D., Ph.D., 12 mo of 150 pages. Philadelphia and London, W. B. Saunders and Co., 1922. Cloth $2.00 net. J. F. Hartz and Co., Toronto.

The Archives of Diagnosis—A Journal published four times a year and devoted to the study and the progress of diagnosis and prognosis. Founded by Heinrich Stern, M.D., LL.D., F.A.C.P. Published by Rebman Company, 141 West 36th Street, New York. Single Copies $1.00. Subscription in the United States and Colonies, $3.00 a year; foreign, $3.50.

Practical Psycho-Analysis—By H. Somerville, B.Sc., F.C.S., L.R.C.P., M.R.C.S., 142 pages. Published by Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden, London, England, 1922. Price $1 50 net.

Internal Secretion and the Ductless Glands—By Swale Vincent, LL.D., D.Sc., M.D., M.R.C.S., L R.C.P., F.R.S., (Edin.), F.R.S. (Can). F.Z.S. Illustrated. Second Edition. Price $3.00 net. Published by Edward Arnold and Co., 41 Maddox Street, London, W.1, 1922.

The Canadian Medical Association Journal

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THE BROADENING SCOPE OF MENTAL MEDICINE*

A. T. Mathers, M.D.

Director, Psychopathic Hospital, Winnipeg.

PERHAPS the outstanding characteristic of our time is its uncertainty. We look about us at a world in flux—a world that seems immersed in a queer mixture of radicalism and conservatism. We bravely assume an outward mien of equanimity, although within us our hearts are oppressed with foreboding. Unrest, distrust and discontent like birds of ill omen fly heavily back and forth across our outlook. Like the dense growth of a jungle the complexities of our life rise about us, and each day's sun instead of bringing us nearer that blessed day when all things shall be as they should be, brings us face to face with new difficulties and new confusions. It is as if we stood upon a road, ribbed by light and shadow and passing but a short distance ahead into a dense fog of uncertainty. Man hates uncertainty. He is prone to people the future with the pleasant or with the terrifying phantasies of dreams.

But in this Time, new forces rise; old forces take on sinister aspects or set themselves to oppose the new. Where all this may end we know not, but a measure of consolation comes to us when we consider that change is eternal and that after all it is the survival of upheavals; the steady progress onward that stamps man as great; this, rather than the making of many machines and the building of cities, for we do remember that iron rusts and strong granite crumbles into dust. And with our peace disturbed we must needs find a reason, and, forsooth, we have no difficulty in finding many reasons. One blames war, another governments, another lack of faith, and so on. But perhaps in our looking abroad for some mighty influence we have not paid sufficient attention to the tendencies and characteristics of the individual man. He is the unit of which human society is built. His life is lived not unto himself alone; it has its influence on all about him and is in turn played upon and moulded by myriad influences from without. "I am a part of all that I have met." Great world movements seeming to originate in the minds of a few, owe their progress to the united minds of all who participate, and this is true whether the ultimate goal be good or evil. Great universal forces such as religion, law, literature, have not sufficed to prevent catastrophes. Perhaps we shall get along better when we know more about man himself. And the striving for this knowledge constitutes one of the grounds of endeavour of those interested in mental medicine; a study of the whole man, body and mind; a bringing to the light of day the motives that control his conduct, a tracing of the multitudinous relationships which intangible, yet bind him as with bands of steel to his environment.

From the time when the first living creature appeared in the primordial ooze, there has been a fierce struggle for existence. Among lower forms of life different methods of perpetuating species have been tried; with some, the method of profligate propagation, in the dim hope that of the myriads brought into life, a fair number would survive its vicissitudes and continue the species. Others have met the struggle by the development of protective structures such as shells, horns, claws, etc. Man perhaps owed his premier position among the forms of life to the fact that down through the ages he has never been led away from the development of a nervous system and intelligence. (1)

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*Delivered at the Ontario Neuro-Psychiatric Meeting, Toronto, Ont., February 20th, 1922.

And in the ten thousand years that man has existed, he himself has had fierce difficulties with which to contend. The individual urge has at all times been curbed and restrained by the demands of the herd. The long years, yes, centuries of struggle toward stable government and stable living conditions, are the best witnesses of the bitterness of the struggle between individual and group aspirations. To-day in most parts of the world, the struggle has in many ways come to a termination. The will of the herd, as expressed in organized government and society, has triumphed, but individual aspirations are by no means destroyed. We are faced with the necessity of studying them carefully for they contain somewhat of both good and evil.

And we face a serious difficulty right at the beginning. In the process of establishing society someone, somewhere put forth the dictum that all men are equal. It was seized upon, passed from mouth to mouth; again and again it has been the war cry of the multitude. To-day it constitutes the raison d'etre of those who burn incense at the shrine of that shifty God, Democracy. But can it be that all men are created equal? Just one moment's thought and we are satisfied that they are not and never can be equal, and could the facts of individual existence each day be fully and plainly recorded, they would abundantly bear witness to this fact.

Intelligence is not equally and uniformly distributed. We are aware of differences in the emotional and volitional capacities of those about us and ourselves. But these differences, important as they are, are difficult to evaluate. On the other hand, we have at our command the means of establishing, with a fair chance of accuracy, the degree of development of intelligence. The wide-spread application of tests of intelligence has revealed a perfectly astounding variation in individual intellects. And, now that we know of these variations, we are seeing explanations for some at least of the problems that have puzzled society for years. We recognize that there are grades of defective intelligence that are not accompanied by the physical characteristics that rendered the recognition of the idiot and the imbecile an easy matter. And further, we find that it is this type of mentally defective individual that, while passing heretofore as a normal person, has been causing some at least of the unexplained things that appeared to be serious defects in the social organization. The child comely in appearance but backward at school; the man whose economic life is marked by continual failure; the individual, who in spite of retributive justice, commits the same crime again and again; all these stand, not as examples of social injustice and lack of opportunity but as cases of inadequate personal endowment and development.

The medical profession cannot but be vitally interested in all this. We must know how to recognize these people. We must provide institutions where the more grossly incapable shall be comfortably cared for. We must bend our energies to the discovery and prevention of the causes of inferior intellectual development. At present we do little; the feeble-minded without stay or hindrance enter into the life of the community, attempt to assume responsibilities they are in no whit capable of assuming, bring children into the world in about twice the proportion that normal people do and children, moreover, who twice out of three times are as defective or worse than the parents themselves.

With all the variation that we know to exist among individuals, we continue to proclaim a doctrine of equality, and in practice instead of recognizing and dealing with individual variations, we attempt to bring all to a dead level of uniformity. And, if one may judge present tendencies, the level of uniformity is not high but rather one of ghastly mediocrity.

There will always be an irreducible minimum of mental defect, since always there are going to be brains damaged by the accidents of childbirth or the infectious diseases of early life. But what we must recognize and prevent in so far as we are able, is the unnecessary increment in mental defect due to such things as alcohol, syphilis or feeble-mindedness in the parents.

And what shall we say of mental disease? It seems passing strange that the interest in mental health is of such comparatively recent development. No doubt this is in part due to a wide-spread belief in the essential separateness of mind and body. Man has been curious about the structure and functions of his body, but his study of mind, for countless years has been a poor puny thing. Psychology has distinctly been of the "rose water" variety. Wheeler (2) aptly says, that to a chance visitor from Mars, most psychologies would read as if they had been composed by beings that had been born and bred in a belfry, castrated in early infancy and fed continually for fifty years through a tube with a stream of liquid nutriment of constant chemical composition. Whether we agree or not, and most of us would agree, we will at least admit that our approach to the study of mental life has been a very halting movement, held back by a variety of influences among which fear of the unknown and ecclesiastical propaganda have not been entirely inactive. It has been this lack of knowledge of mind, this diffidence to inquire, this "unwillingness to face the ethically and æsthetically unpleasant" that has been responsible for the gross indifference exhibited toward mental disease by the public, by governments and by all but a mere fraction of the medical profession itself. Those sick in body have received much attention. Those afflicted in mind have, until recently, had naught to look forward to but confinement in barrack-like institutions, poorly equipped and poorly manned. Here they have been placed where eye might not see, nor ear hear. Here the minimum of food and shelter has been provided. Rarely, until of late, has any effort been made to solve the problems presented by each individual case. Treatment of mental disease compared with treatment of physical disease has been a marasmic child kept from becoming the force for good that it might be by the indifference of governments, public and profession alike. But within the past few years we have seen signs of a change, an interest has appeared. It is for us to say whether that interest shall continue to live and grow or whether it shall again fade till it resembles nothing so much as the uncertainty of a dream. We will not be satisfied until the care and treatment of mental disease stands on an equal plane with that accorded physical disease. We shall go further: we shall say that we will not be satisfied until the essential relationships between physical and mental disease are so well recognized that nothing short of the best possible care for both will be accepted by profession or public. We must get away from the idea that psychiatry is an isolated subject. It in its fulness demands all that there is in medicine; hospitals for mental disease must not be highly specialized institutions; they must indeed be highly generalized.

For the sceptics who feel that effort toward the alleviation of mental disorder is futile, I may state in passing that our experience in the Manitoba Psychopathic Hospital has revealed something vastly different. During the two years of its operation, an average of a little over one-third have had to be committed to a Provincial Hospital. Approximately two-thirds have returned to the community, not all cured but restored to a reasonable or better degree of usefulness. We are assured that a hospital where mental disease may be studied completely, where concurrent and contributing bodily disease may be treated and where, most of all, *early* attention is available, is one proven stronghold against the battalions of the "Kingdom of Evil."

Then there is the great field of relationship between crime and abnormal mental states. Crime, we have no doubt, is as old as mankind. Primitive man, we may imagine, was governed in his life by instincts unrestricted at first by law or custom. In his communities, for in him the herd instinct was as active as in other mammals, customs developed and these recognized finally by the community, formed the basis of law. No doubt the rights of the individual and of the community at times were set at naught by certain individuals and in such cases justice took the form of undisguised retribution. An eye for an eye and a tooth for a tooth represented the extremely practical form of treatment meted out to the wrong doer, not by the community, but by his outraged and exasperated victim. Such a system of dispensing justice often enough resulted, we may suppose, not only in a balancing of accounts but in a fresh state of unbalance in which the relative positions of wrong doer and victim were simply transposed, and this only because the treatment was bound to be thorough and the rates of exaction about two teeth for one. As this process went on, the attention and sympathies of others were attracted, family and community feuds arose and soon reached the proportions of civil war with all its melancholy entail of blasted lives and happiness.

With the object of limiting the length to which personal retribution could be carried, the state gradually took the matter into its own hands, so that for hundreds of years now it has, through its established institutions, drawn up and enlarged a criminal code, apprehended law breakers, and these when found guilty it has uniformly locked up, a few to be helped thereby, many to receive no benefit and some to be actually harmed. The law has not been able to explain how so many law breakers fail to benefit from the treatment dealt out to them. Public revenge, the idea of deterring others who might follow similar courses, even the idea of reform as held by the authorities of some penal institutions, these have no appeal to the individual who through inherent improvidence, complete lack of appreciation of the rights of others and absolute inability to profit or be guided by experience, commits one depredation after another on society, and is punished each time by the regulation imprisonment for some months. We are not worried about the occasional criminal; he accepts and is probably benefitted by punishment; but we have a very definite interest in the type of humanity known as 'habitual criminals'. It is in the treatment of these that psychiatrists believe the present system reveals its weaknesses.

Criminologists from Lombroso onward have sought for explanations. The present view is that anti-social behaviour is a reaction to a great many influences both intrinsic and extrinsic. It seems possible that the law with its tendency to formulate and pigeonhole, has failed to adequately meet the problem of criminality simply because in its careful weighing of crime and punishment it has been impersonal instead of personal. In its enthusiasm to hang the wrong doing on some peg in the criminal code, it has lost sight of the wrong-doer. It seems that social defence and individual re-adjustment which after all must be the basis of law administration, can only be attained when not only crime and punishment are thought of, but when, in addition, the criminal himself is appraised as to his personal makeup. Only in this way can treatment be suited to the case in hand. One would be sceptical of the physician who sent his patient to hospital for a definite number of days and then discharged him regardless of the nature and status of his malady. Should we not be equally sceptical of the business of locking up and releasing wrongdoers while blissfully ignorant of the nature and future possibilities of the individual so dealt with?

So far the chief work of medicine in dealing with crime has been in connection with Juvenile Courts. In Manitoba, where, by the way, the first juvenile court in Canada was established, there is a psychopathic department in the Court. To this the judge refers such cases as appear to him abnormal, and all cases in which repetition of the same offence seems to indicate the presence of an abnormal trend. The report to him embodies reports on physical examination, family and personal history, school progress, social and economic reactions and psychological examination. From such a longitudinal section on that child's life, throwing light on the "multiple determination" of delinquency, the judge arrives at his decision. More and more is similar work being done in the Superior Courts where the crimes are more serious and the offenders, adults.

When we come to the consideration of industry, we are obliged to admit that the attempts of psychologists and psychiatrists to elucidate the problems of industry have so far resulted in more gain for psychology than for industry. (3) The application of mental science to industry is but in its infancy. The object in view is to show how the laws of human behaviour may be exploited to advantage; to show that with the difficulties of management and the healthy aspirations of labour considered, much can be done toward the elimination of waste not only of material but what is more important, of human energy, which, when misdirected, might almost better be lost. The number of square pegs in round holes ought by this means, to be diminished, individual aspirations come nearer to their fruition and many of the grounds for misunderstanding done away with. One would not for one moment suggest that all industrial ills have defective, poorly balanced and unhappy states of mind as their initiating factor. What one would contend is that they play a part and that many of the involved situations they engender might be prevented.

"Every individual by his behaviour exerts some influence upon those with whom he is associated and this influence is either beneficial or the reverse. If we are to define what is meant by a normal personality, we can only do so in terms of his behaviour or reaction to life. That man is normal whose conduct is on the main creative, helpful to others and productive of useful social results. In contrast to this the conduct of the moron, inadequate personality, misfit, crank and neurotic is ineffective, obstructive, futile and non-productive. And the results of such ineffectual reactions to life are not confined to the abnormal person but exert a widespread influence upon the actions, happiness and mental attitude of others." (4)

And so we are sure that the psychiatrist has an outlook upon, and is in close contact with some of the vital social problems of the day.

We need do no more, scarcely, than mention the field for mental medicine in connection with schools and child-life generally. Apart from the need for clearer recognition of individual intelligence variations and the suiting of school work to these, we have much to learn concerning the rate and progress of mental development. We have known for a long time that physical development of organs and body parts does not go on uniformly throughout the whole organism and experience indicates that mental development goes on in much the same irregular fashion. School authorities know little about this, but it is most important that they should know a great deal. The problem of the emotionally abnormal child can only be met by medical investigation and care. The present school curriculum is an inelastic thing founded on the belief, apparently, that children, like most other things nowadays, are standardized, and are capable one and all of undergoing a standardized training for life. There must be a return to individualization and the only way in which this can be accomplished is by making an inventory of mental capacities and attributes as important a thing as the inventory of body mechanics that has for a considerable time now held so thoroughly the attention of public and educationalists alike.

And now at long last we approach the question of the relationship of mental medicine to the rest of medical art and science. In the past decade medicine has approached its nearest to the status of an exact science; exact in the sense that we have been taught and expected to find for each ill a specific cause and structural change; so exact that in a sense we have almost got to the place where we view our patients from a sort of diagnostic eyrie located in a pathological laboratory. While mindful of the benefits bestowed upon us by laboratory medicine, one feels that this tendency has been fruitful of many pernicious results. In a large degree it has been fatal to that integrated view of the sick individual that reveals him not as a diseased gall bladder, decompensating heart and what not, but as a maimed organism. True, a body marked by the onslaught of disease in tangible form, but, in addition, a delicate intangible something through which each material catastrophy echoes and reverberates, disturbing in we know not how serious a degree the delicate balance between part and part and between organism and environment. In its frantic search for altered secretion and deformed tissue cell, medicine has forgotten and continues to forget that there is an art as well as a science of medicine. The masters of effrontery who with consummate brazenness hawk their wares before a gullible public, have not been so slow to discover that the sick man is desperately in need of sympathy and reassurance and this they give him in large doses accompanied by some impressive form of manipulation. One feels that the exuberant growth of pseudo medical sects at the present day points definitely to one thing at least and that is a neglect on the part of medicine itself to provide for distress of mind as well as disease of body.

Mental Medicine has probably gone to the other extreme and in its belief in the separateness of mind and body, it has not only disdained to look for alterations in bodily function and structure, it has actually allowed itself to be almost completely isolated from medicine itself. Specialization is right and proper to a certain point; in this way advance is made; but as Cushing (5) says it is possible for a specialty to get split off permanently from the sphere in which it originated. "It becomes an isolated body revolving in a narrow orbit around its own subject from which it ultimately ceases to draw much light or heat. For when a specialty gets very far removed from greater medicine, no matter how bright its original flame, it rapidly cools to the loss no doubt of both medicine and specialty." Mental medicine has this to learn, that it is in reality part of medicine; no doubt the most generalized of all medical specialties but part of medicine nevertheless. Furthermore it must needs remember that bodily malfunction is by no means a negligible factor in the production and continuance of mental disorder, and knowing this it must be prepared to take the broadest possible view of the distresses and discomforts of all those who seek its aid. General Medicine in turn must recognize an essential kinship with Mental Medicine. It must learn to view sick people with an understanding mind delicately attuned to catch not only the faint swish of blood past a damaged heart valve, the delicate reaction in a test tube, but also the apprehension, fear and distrust that torment the mind.

> "Canst thou not minister to a mind diseased
> Pluck from the memory the rooted sorrow
> Raze out the written troubles of the brain
> And with some sweet oblivious antidote
> Cleanse the stuffed bosom of the perilous stuff
> That weighs upon the heart."

Students who now hear nothing of the part that personality plays in disease must be taught to scan their patients' lives for that abnormal sensitiveness and that emotional instability that play no slight part in painting the disease picture. Their question must be not "What is happening to this man's heart, lungs or kidneys" but— "What is this individual trying to do? Has he actual solid pathology that will account for all his complaints? Has he no solid pathology at all or has he a moiety of structural and functional change nestling in the midst of a large cloud of abnormal mental reaction?"

Of the physician's own personality we need only say that there is no single factor that speaks louder for success or failure in medicine than the possession or lack of "that which inspires faith in a sick man, who, as he lies a crumpled wreck, longs for the kindling spark of happiness, the ray of hope to light his darkness." He who would be a psychiatrist must also be a physician and in very truth he who would be a physician must ever and always be something of a psychiatrist. And so day by day physicians practising their art with steadfastness, with inexhaustible hope and inflexible resolution, may know that while much is known, much remains to be known. They may well pray that they live "not as fools and fine gentlemen, not beaten by the muddle, but like good fellows trying by some dim candle light to set their workshop ready against to-morrow's daylight."

It seems to me that mental medicine gives a scope that demands our most serious efforts. We are not, I trust, among those who fold their arms and settle all problems by some simple and all embracing formula, nor are we to be numbered among those who, terrified by the growing complexity of their problems, abandon themselves to the narcotic dreams of mysticism. We would fain stand among those, who, realizing the values and aims of the art and science of medicine, know full well that each increase of knowledge but increases our contacts with the Unknown, (6) "that untravelled world whose margin fades forever and forever as I move." To us is given the task of unravelling the tangled skein of human behaviour benign and otherwise and as we search for motives and mechanism; we are inspired by that which seems to indicate a lofty and glorious destiny. We must not be dismayed when under the surface of our much vaunted intellectual idealism, under all of our most intense self satisfactions, we find nestling, the primitive. When we recognize that it is still with us, we shall understand conduct better and shall be less chagrined when our carefully raised social regulations at times give way with a rush. Of a surety, this we do well to remember that—"Out of wild nature we are come, that our instincts are great and our wisdom little, that the main current of our will is still like the green moving waters and our reasoned choices like the flutter of foam on its surface, that we became citizens but yesterday and were bred in the wilderness." (7)

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(7) Carved, by some unknown person, on a rock in the grounds of Culver Military Academy, Culver, Indiana.

Snow Blindness.—Light which contains an excess of ultra-violet rays is more irritating to the eyes than light consisting of visible light rays only, and naked arc lamps, when being tested photometrically, produce definite pathologic effects on the eyes of those carrying out the experiments and exposed to their influence. The ultra-violet rays are of intense chemical activity, and it is these rays which produce the symptoms associated with electric light conjunctivitis, either by stimulating the nerve ends in the conjunctiva or by some direct chemical irritation of that membrane. The consensus of opinion would indicate that in electric light we have an illumination that is capable of greater injury to the eye than gas, and very much greater than that of an oil lamp. In incandescent lamps used for house-illumination there is an irritating effect from long-continued exposure to the visible chemical rays. An oil lamp is less rich in actinic rays and gives a yellower and softer light.—A. W. Ormond, Guy's Hospital Reports, 71 : 195, April, 1921.

SYMPTOMS IN DIAGNOSIS OF PULMONARY TUBERCULOSIS*

J. H. Elliott, M.B.

Toronto

THE examination of any patient will naturally begin with a statement of the symptoms for which he presents himself, not only those now complained of but those which are elicited from him as being present but which he may not have noted or failed to consider of importance. Past symptoms of disease are also of importance and have been discussed under the heading of history which must concern all variations in health in the past.

Nor must we expect to find in any one case all the symptoms which may be present, and which are usually considered as suggestive of the presence of tuberculosis. One or many of these may be absent, for as the clinical course of the disease varies from a rapid acute process, to one covering many years of a human life, so the symptoms vary in different cases, and in the same case at different times. At one extreme stands the case with closed foci in the lung which never set up symptoms and near this the one with a series of minor symptoms of ill health, not definitely pointing to tuberculosis. At the other extreme is the case where all recognized symptoms of the fully developed disease may be present. Between these extremes are cases in which a single symptom is outstanding, or a combination of any two or three or more of these.

In diagnosis of tuberculosis of the lung we may place our symptoms in two classes. (1) Disturbances due to the toxins of tuberculosis, i.e. constitutional disturbances as apart from (2) local or focal symptoms arising from the presence of disease in the respiratory system itself.

No single symptom is in itself sufficient to warrant a diagnosis of pulmonary tuberculosis.

CONSTITUTIONAL DISTURBANCES

Among the more important of these which we shall discuss are,

(1) *Fever.* Most cases will show at some time more or less irregular rises of temperature with the maximum usually between 4 and 6 p.m. It is increased by exercise and if rectal temperatures are observed it rises higher and does not fall as rapidly as does that following exercise in healthy persons. Frequent rises of the mouth temperature to 99.3 or 99.5 during rest, must be regarded as fever. For accurate observations, the three minute thermometer must be kept in the closed mouth for at least five minutes, and the one minute or half minute thermometer for a full three minutes. Do not forget that on a cold day the temperature taken by the mouth is rarely registered accurately if the patient has just come into the office. The slight normal rise after meals may be increased in tuberculosis, and the morning temperature which is usually below 98 in health may be 98 or over in the presence of a tuberculosis. So also the pre-menstrual rise frequently noted in health may be accentuated and some show an intermenstrual rise.

(2) *Loss in Weight,* gradually progressive, with no apparent reason, particularly in a young person, at once suggests tuberculosis.

(3) *Fatigue* is a symptom which is usually but not always associated with loss of weight. General lassitude or the complaint of becoming tired before the day is over may or may not be associated with tuberculosis.

(4) *Circulatory disturbances,* e.g. (a) increased pulse rate at rest. This associated with other symptoms here recorded is suggestive.

(b) Pallor and malar flush may be both present, or either alone. "Every girl or young woman who has neither genuine chlorosis, Bright's disease nor syphilitic anemia, but has the appearance of chloro-anemia, must be suspected of having tuberculosis." (Dieulafoy)

(c) The blood pressure is usually low, returning to normal with improvement in health.

(d) Blood changes are not marked in the early stages, and the haemoglobin is most affected.

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*Being part of a Symposium on the Diagnosis of Pulmonary Tuberculosis. Other papers will appear in next issue.

(5) Gastrointestinal disturbances may overshadow the pulmonary symptoms in the early stages. Anorexia is common or the appetite may be variable. Irregular constipation is the rule rather than the exception. Occasional attacks of diarrhoea may be present without ulcerative disease of the bowel. The gastric juice may be inefficient because of hypo-secretion. Indigestion occurring in a person previously free, associated with malaise, loss of weight and cough makes a careful pulmonary examination essential.

The significance of fistula-in-ano has been discussed previously.

(6) Menstrual disturbances are frequent. The flow may be much diminished or absent very early in the disease, returning to normal with improvement in health. Leucorrhoea may develop, and if present become worse.

Local Symptoms

(1) Cough is usually the first manifestation of the disease, and is usually the first noted by the patient. Any cough persisting over six weeks, demands the exclusion of tuberculosis as a cause. It may be present only on rising or may be intermittent during the day, and rarely worse on lying down at night. It tends to become more severe as the disease progresses, and to lessen with any period of retrogression of the lesion. The early cough is due to a bronchial catarrh induced by the presence of tubercles near the bronchial mucosa. Later there is added to this the discharge from caseous areas which drain into the bronchial tree, with tubercle bacilli present.

Occasionally the patient may have a number of symptoms pointing to the presence of tuberculosis and cough be absent, i.e. definite clinical tuberculosis may be present without cough.

(2) *Expectoration* as a rule is associated with the cough. In the early stages it may be purely from a bronchial catarrh and is usually mucoid or slightly purulent. When caseated areas are draining, it becomes more purulent and tubercle bacilli are present. It has no distinctive characteristics except perhaps when cavities are present and nummular sputum is seen.

(3) Blood may occur in the sputum in any quantity, minute specks or streaks in the mucopus, as a pink or brick red sputum, or as pure blood in varying quantity up to a pint or more, depending upon whether its source is diapedesis through an inflamed mucous membrane, oozing through the base of an ulcer, or flowing or spurting from an open vessel. Haemoptysis occurs at some time in the course of the disease in about one half of all cases of tuberculosis. The true significance of this symptom is constantly being overlooked, not in the self evident case of phthisis but in those in which bloodspitting occurs as an initial symptom without notable impairment of health or the presence of well marked physical signs. No one should be guilty of reassuring a patient with haemoptysis that he has broken a vessel in his throat unless the bleeding vessel can be seen. The significance of bloodspitting of obscure origin is admitted, yet the absence of corroborative physical signs or symptoms will frequently induce a physician to pass over the symptoms lightly and deny to the patient his suspicion or even belief as to its origin. "I do not deny that the causes of haemoptysis are numerous, but I assert that the causes of genuinely obscure haemoptysis in temperate climates may be reduced to one—pulmonary tuberculosis." (Cabot).

Recurring colds. The frequent statement "I have had a series of colds, a fresh one before the previous one cleared up" is most suggestive of tuberculosis, if the colds are bronchial. Particularly must attention be paid if there is an association with persistent or recurring transient hoarseness. It may or may not be due to a tuberculosis of the larynx.

Nervous System. Associated with the constitutional symptoms of general debility, fatigue or perhaps loss of weight, nervousness is frequently reported. It is a part of the general debility. Among the local symptoms associated with tuberculosis of the lung we frequently find (a) pain in the chest and (b) localized areas of hyperaesthesia. Chest pain is one of the most common manifestations of tuberculosis. The character of the pain varies.

In conclusion. A careful consideration of symptoms is very important in the diagnosis of pulmonary tuberculosis. At times a diagnosis may be arrived at before the appearance of definite physical signs or when physical signs are slight, and as physical signs may be present in both active and quiescent cases symptoms form a better and more accurate guide to determine activity, than does a physical examination of the chest.

DIFFERENTIAL DIAGNOSIS*

J. H. Elliott M.B.

Toronto

In this discussion of differential diagnosis of conditions which may be confused with pulmonary tuberculosis we shall consider only those cases in which there is no sputum or in which several examinations of the sputum have revealed no tubercle bacilli. Such cases have been well divided into two groups by J. A. Miller.

1. Those in which the history and symptoms are suspicious of tuberculosis, but the local lesion is slight and difficult to find. A problem in physical diagnosis.
2. Those presenting very definite physical signs in the lungs. A problem of interpretation.

Group 1. In our study we have already discussed the various lines of investigation to be made. The importance of these has been made clear.

In the personal history the patient's diagnosis of any previous illness (e.g. typhoid) should be criticized, remembering that when a patient has symptoms suggesting tuberculosis one usually can elicit a history which points out one or several periods of mild or even severe tuberculous activity. The bearing of family and household contact and of family resistance have been pointed out. The important symptoms and history of loss of weight, strength, fever, acceleration of pulse, lowered blood pressure, cough and expectoration, haemoptysis, hoarseness, gastrointestinal disturbance including fistula-in-ano, previous pleurisy and other conditions are now only mentioned in review.

I. Non tuberculous conditions whose symptoms, principally constitutional, resemble tuberculosis.

(a) Focal infections

1. Intranasal conditions.
2. Dental infections.
3. Diseased tonsils.
4. Middle ear disease.
5. Abdominal infections—localized in gall bladder, appendix, urinary system, prostate, pelvis.

These may set up such symptoms as debility, loss of weight, fever, acceleration of pulse, pallor, anemia, and gastro-intestinal disturbances, and at times rather confusing focal signs in the lungs. These conditions are to be excluded, and a leucocyte count, both total and differential may be of assistance.

(b) Graves' disease and other disturbances of internal secretion. These may give rise to great difficulty in diagnosis especially when an enlarged thyroid causes a chronic cough, and particularly when there is a slight afternoon rise of temperature, accentuated by excitement or exertion.

(c) General asthenia,—the condition spoken of as physiological poverty. This is seen particularly in some women and during adolescence. There is a frail constitution, and if patient is subject to slight recurring colds the picture is even more confusing. In such cases prolonged observation may be necessary while carrying out treatment which is much the same whether the symptoms be due to tuberculosis or not.

(d) Chlorosis and anemia. This occurs in the same class of patients as the former and the same observations apply.

(e) Fever of obscure origin.

1. Typhoid and paratyphoid—the methods of differential diagnosis need not be discussed here. These fevers are confusing only for a time, but especially confusing when bronchitis and cough are present.
2. Malaria is confusing in localities where endemic but need only be mentioned here
3. Influenza—may be at times the diagnosis of a careless practitioner when asked for a name for a mild febrile attack. Any patient with cough, especially if fever also be present, must be kept under observation until the cough has been satisfactorily explained.

(f) Certain chronic pulmonary infections with cough and sputum, but which may present few if any physical signs.

1. Chronic bronchitis.
2. Early bronchiectasis.
3. Pulmonary abscess, if deep seated.
4. Chronic empyema, interlobar.

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To eliminate these, careful study of the history and symptoms are essential and the X-Ray in competent hands may prove of great assistance.

II. Cases with well marked physical signs in the chest. In this second group are a number of conditions which present physical signs which at times are confusing.

(a) Emphysema with chronic bronchitis. A number of points may be considered, seasonal variation, the number of attacks, the constitutional effects, amount and character of dyspnea, the bilateral and usually basal distribution of the rales and their bronchial character. The rales may lessen or disappear temporarily with cough and from day to day, while those of tuberculosis are more apical, constant, and increase with cough.

(b) Post influenzal conditions.

1. Unresolved or subacute or chronic bronchopneumonia.
2. Bronchiectasis.
3. Abscess.
4. Chronic empyema.

These have occurred frequently following epidemic influenza and may occur independent of the presence of an epidemic. They have been grouped by some writers under the title chronic pulmonary suppuration. They are to be excluded in all cases with persisting cough, with purulent sputum in which repeated examination reveals no tubercle bacilli. When the infection is extensive or near the surface of the lung there are usually very definite physical signs. In bronchiectasis and abscess severe haemoptysis may occur which still further confuses. There may be persistent fever or recurring attacks. Whereas the principal lesions in tuberculosis are usually apical or subapical, in these they are principally in the lower lobes. Clubbing of the fingers is suggestive, and does not indicate tuberculosis when tubercle bacilli are absent.

The rarer pulmonary conditions of malignant disease, syphilis, the mycotic infections and the various forms of miners phthisis (pneumonoconiosis) are only mentioned by name.

To conclude, differential diagnosis cannot be taught nor summarized in a short paper—only a few important points can be emphasized.

Usually a process at the apices should be considered tuberculous and a process at the base to be non-tuberculous until the contrary is proved, excepting when a clear history of pleurisy with effusion is present.

In the absence of constitutional signs and symptoms and little suggestive past history, there should be demanded definite physical signs in the lungs including persistent rales in one or both apices.

When suggestive constitutional symptoms are present as previously defined we should demand the finding of some abnormality in the lungs, either on ordinary physical examination or by a competent radiologist.

A frank haemoptysis is to be considered evidence of active tuberculosis until the contrary is proved.

A history of pleurisy with effusion, of fistula-in-ano with suggestive symptoms or physical signs will go far to confirm a diagnosis.

In doubtful cases, there should be two to four weeks' observation of pulse, temperature, and weight with repeated sputum examinations and clinical study. Radiological studies must not be omitted.

And in a disease where so much depends upon early diagnosis and treatment the ethics of our association demand the assistance to be gained by conference and consultation.

Methods of Precision in Diagnosis of Diabetes.—In the cases cited by Henry J. John, Cleveland, the condition was diagnosed as diabetes mellitus by the patient's physician on the basis that she had sugar in the urine. She was put on a rigidly restricted diet and kept on it until she had lost almost 50 per cent of her weight; but she still showed sugar in the urine. Further examination revealed that she had a normal blood sugar content; and her ability to utilize carbohydrates—the glucose tolerance test—was demonstrated to be normal by a perfectly normal curve; that is, she was able to utilize all the carbohydrates one could give her. This was strikingly demonstrated later on, when a heavy carbohydrate diet, high in calories as well, failed at any time to bring her blood sugar above the normal level. These findings show clearly that the case was not one of diabetes, in spite of the fact that there was sugar in the urine, but a case of a kidney permeable to sugar, a fairly common condition.—Jour. A. M. A., Jan. 11, 1922.

A TUBERCULOSIS SURVEY OF 1346 SCHOOL CHILDREN IN SASKATCHEWAN

Robt. G. Ferguson, M.D.

Fort Qu'Appelle, Sask.

In July 1921, a Royal Commission was appointed by the Lieut. Governor in Council, in Saskatchewan, to investigate the extent of tuberculosis in this province. A tuberculosis survey of 1346 of the 170,000 school children in the province was one of the tasks undertaken by the Commission.

The objects of the school survey were fourfold:—

1.—To determine the incidence of tuberculous infection among the school children.

2.—To discover as far as possible the sources of tuberculous infection in the areas selected.

3.—To ascertain the prevalence of the pathological, economic and social conditions which would tend to develop tuberculous infection into tuberculous disease.

4.—To find the frequency of tuberculous disease among the school children.

From the above objects you will see that the problem was approached from the preventive end, stressing the incidence of tuberculous infection and the presence of pathological conditions that would contribute to the breakdown. The finding of cases of active disease was secondary and part of the larger plan. Eight areas in the province were selected as being representative and suitable for this investigation. Arrangements were made by the Chairman of the Commission with the school boards for the survey in these areas. The parents were circularized and permission secured for complete examination of their children. Approximately two hundred children between the ages of 6 and 14 were selected for examination in each area. In all, 1184 white and 162 Indian children were examined. The examining team consisted of four nurses and two chest specialists whose services were required continuously throughout the survey; a dentist, and two, ear, nose and throat specialists, whose services were required for two days only in each area. The work was planned so as to commence the examinations in an area on Monday and complete it within the school week.

The examination consisted of two parts. A preliminary, or selective examination for the purpose of selecting suspects; and a final or diagnostic examination of all children selected as suspicious by the preliminary examination. The principle of selection of cases was as follows:—All children received the tuberculin test and had an afternoon temperature and pulse taken. These were taken in the classrooms, the thermometer remaining in the mouth ten minutes. Those whose temperature was above 99.4 or had a marked acceleration of pulse had both temperature and pulse checked the following afternoon. In the meantime the weight had been recorded and reduced to variation from normal; the teeth and tonsils had been examined by the specialists and findings recorded. The children appeared at the 48 hour interval to have the result of the first tuberculin test recorded, if negative, it was repeated. On this occasion the chest specialist palpated the cervical region for glands, and examined the child's chest for conformation, movement, venous arborization and evidence of winged scapulae.

The quantities in the problematic equation for the selection of suspect cases were then: (1) Undernourishment; (2) elevated temperature; (3) accelerated pulse; (4) glandular enlargement; (5) flat chest; (6) limitation of chest movement; (7) physical energy; (8) activity in sports; (9) tuberculin reaction. Taking into account these signs and symptoms, and making allowances for reaction in the case of focal infection and acute upper respiratory diseases, these cases were sifted down to those considered suspicious of tuberculosis, and the latter were selected for complete chest examination. Out of the 1,184 white children, 286 or 24% received a complete chest examination, and of this number, 46 had radiographs of chest taken.

Incidence of Infection Among School Children

In order to find out the extent of tuberculous infection the tuberculin cutaneous test was used.

This test was made on 1,346 children in attendance at schools in eight representative areas in the province and it was found that 56.6% showed signs of previous infection with tuberculosis. The incidence of infection among the males was slightly higher than that found among females. being 57.1% in the former, as compared with 54.9% in the latter. It will be found from the incidence by age that 44.4% of the children were infected at the age of 6 years, the age at which the average child commences school. An increasing percentage reacted positively each year (excepting an irregularity at the age of 9 years) reaching 60.9% at the age of 14. It was found from the incidence by nationality that the Indian children showed a very high percentage of infection—93.1%, compared with the average for other racial origins—54%. The relation between incidence of infection and place of birth throws some light on the tuberculization of the Saskatchewan-born as compared with those born in other provinces of Canada as well as with British born. The number of Europeans as well as Americans born in the area of the survey was not sufficiently large to justify a conclusion.

Sources of Tuberculous Infection

The investigation of the sources of tuberculous infection revealed the fact that 10% of the 1,184 children examined had a history of exposure in their homes at some time to persons suffering from tuberculosis. The possibility of exposure in the community is suggested by the fact that in the representative areas from which the children examined were selected, 753 persons died of the disease during the past four years. 488 of these died in their homes without having had a special training in the precaution necessary to be observed in order to protect others.

The result of tuberculin tests made on 3,649 milk cows in the eight selected areas was as follows:—

In three of the areas where many of the cattle had been tested for several successive years, 2,791 tests were made and 3.8% reacted positively. In the remaining five areas where the cattle had not been previously examined, 858 milk cows were tested and 20.1% reacted positively. Four of the latter areas were rural and had no large dairy herds. The cows supplying milk to 470 children that were examined, although but 18.3% of these cattle reacted positive. the milk from these reactors contaminated the milk supply of 224 or 47.6% of the children examined in these areas.

Conditions Which Might Contribute to the Development of Tuberculosis Disease

From the survey made of the home conditions in the areas selected it would not seem that this could be considered an important factor. Home conditions were found excellent in 5.7%, good in 84.8% and bad in 9.4%.

Among the conditions found that would predispose to tuberculous disease, undernourishment was the most outstanding. 40.9% of the 1,346 children examined were 5 pounds or more underweight for height and age. 11.3% were five pounds or more underweight and classified as apparently thin by the medical examiners. The undernourishment, however, was not found to be directly accounted for by insufficient food, inasmuch as it was found almost as frequently

Born in Saskatchewan, including Indians	845	of which	58.9%	found	infected.
Born outside Saskatchewan—Canadian, British and European	501	" "	54.9%	"	"
Born outside Saskatchewan in other provinces	238	" "	50. %	"	"
Born in British Isles	165	" "	61.2%	"	"
Born in United States	64	" "	42. %	"	"
European born, including French, German, Roumanian and Russian	34	" "	52. %	"	"
Saskatchewan born, not including Indians	685	" "	51. %	"	"
Saskatchewan born Indians	162	" "	93. %	"	"

The above figures would tend to show that tuberculous infection among Saskatchewan born white children is less widespread than is infection among the children of our immigrants as a whole, in proportion of 51% to 54%, but slightly more widespread than among our immigrants from sister provinces, (in proportion of 51% to 50%). Selecting a definite age group for comparison of the Commission's findings in Saskatchewan with those found in similar surveys elsewhere, we find the following:—

Vender and Johnson, St. Louis, U.S.A.	479	children age 6-14	31.9%	found	infected
Hamberger and Monti, Vienna, Austria	219	" " 6-14	72.2%	"	"
Saskatchewan	1260	" " 6-14	56.6%	"	"
Framingham, Mass.	94	" " 6-7	45.7%	"	"
Saskatchewan	45	" " 6-7	44.4%	"	"
Von Pirquet, Vienna	147	" " 10-14	70. %	"	"
Saskatchewan	795	" " 10-14	57.4%	"	"

From the above it is evident that the school children of Saskatchewan are extensively infected with tuberculosis, although not so widely infected as those in the large city of Vienna. Nevertheless the degree of infection is higher than might be expected in a province in which there are but small cities and a large rural population.

among those with ample as among those with limited means.

Bad teeth was a condition found which would tend to lower resistance and contribute to the development of tuberculosis. Of the 1,346 mouths examined, 47.1% had one or more decaying permanent teeth. Bad prophylaxis and caries of tooth seemed to bear a direct relationship to increased incidence of infection. In the above mentioned group infection was found to be 13% higher among children with bad prophylaxis of the teeth, than among those with good, and 4% higher among those with caries than among those without caries.

Diseased tonsils was a condition present which would contribute to the breakdown. 25.3% of the children examined by throat specialists had diseased tonsils and 18.8% had excessive adenoid tissue.

A history of the acute infectious diseases from which these children had suffered, revealed the fact that before leaving public school 50.7% had suffered from either measles, pertussis or influenza, and 16.3% had passed through a series of three or more acute infectious diseases. Only 49.3% escaped all acute infectious diseases.

Frequency of Active Disease

As a result of the survey it was found that among the 1,184 white children examined, 10 or .84% showed clinical signs, symptoms and X-Ray evidence of active tuberculosis. These children were advised to take treatment in the Sanatorium. 30 or 2.5% showed signs or symptoms more or less suspicious of activity. These children were referred to their family physician for observation.

ERGOT, QUININE AND PITUITRIN

Adam H. Wright, B. A., M.D.

Emeritus Professor Obstetrics, University of Toronto.

Ergot

ERGOT of rye was known and used for a long period in Germany under the name of Rockenmutter. French writers referred to its use as early as 1668, and again in 1777. So far, however, as we have definite information, ergot was first introduced into obstetric practice by Dr. Jno Stearns of New York in 1807. For a long time it was administered chiefly in the form of a powder, and it received the name of *pulvis ad partum;* but when they found it dangerous for the child Dr. Hosack suggested that it should be called *pulvis ad mortem.* (Parvin)

Dewees, in his "System of Midwifery," published in 1839, expressed the opinion that it increased both "alternate contraction" and "tonic contraction," and materially assisted in the expulsion of the child, thus making the use of the forceps unnecessary; but gave a distinct warning that indiscriminate use, or excessive dosage, or both combined, involved grave danger to both mother and child.

It soon came into general use in England, though a few leading obstetricians fully appreciated its dangers, and recommended caution and care in its use, without much effect however, as to the majority of physicians, and nearly all the midwives. Its most enthusiastic supporter was Ramsbotham, who used it freely in tedious labours and also for the induction of premature labour. He reported fifty cases in which the uterus was emptied by the administration of this drug. How he managed is rather a mystery as Murphy and other equally able experts, were unable to accomplish it. Ramsbotham, however, acknowledged that his child mortality was 50% or more, and that, in itself, was enough to make the method unpopular.

Before long, in the United States, its use became general, and it was given in such a careless way that the results were serious. Because of this, many of the best obstetricians expressed the opinion that ergot should be banished from obstetric practice. But others who had great faith in its merits, when properly used, thought otherwise.

QUININE

The power of quinine to produce uterine contractions was first announced by J. S. Wilson, a physician of the Southern States, in 1855. It was largely used as an oxytoxic for some time before its fame had spread to other regions. Its value as an ecbolic became known in France in 1871, and within a few years it came into fairly general use in Europe, the United States and Canada. In 1875-1880 Drs. Fordyce Barker of New York and Albert H. Smith of Philadelphia used it largely, and spoke well of it. Dr. H. F. Campbell, at a meeting of the American Gynaecological Society in 1881, agreed with Barker as to its action during labour, and at the same time expressed the opinion (with apparently the general concurrence of those present) that quinine, except in cases of idiosyncrasy, or from injudicious administration, exercises no influence to superinduce premature expulsion of the foetus.

At that time many were hoping that quinine might be used to produce premature labour, but all efforts in that directoin were unsatisfactory. There is no doubt that quinine helps to promote uterine contractions after they have begun. Its action in that regard, however, is not constant and is largely like that of strychnine, but one good feature in its action is that, unlike ergot, quinine causes intermittent and not tetanic contractions. As to the efforts now put forth to induce premature labour, I think, from what I have heard, they are so much like those that were unsuccessful forty years ago that I don't expect very favourable results.

MEDDLESOME MIDWIFERY

In endeavouring to help our patient in labour we may err in various ways. The origin of that pregnant sentence—"Meddlesome Midwifery is bad"—is interesting. It was first used by Blundell about 100 years ago. At that time Dr. James Blundell was lecturer on midwifery at Guy's Hospital, London, from which position he retired about 1840. He was probably the ablest teacher of obstetrics of his time, and possessed mental superiority so great that he was called the "Lord Bacon of our profession." He held the opinion that a lingering labour was not usually dangerous. He dreaded most the following procedures:- early rupture of the membranes; frequent use of the lever and vectis (instruments scarcely known now); exciting uterine contractions by compression and irritation of the mouth and neck of the uterus and vagina beneath; ergot too early and too much; turning the child when not necessary; perforation of the head of the child.

He said the physician was often forced to act, and with vigour too; but in general, the less he interfered the better. "He is often the best accoucheur who keeps his hands in his pockets." Some of the obstetricians of that time criticized adversely, and said that Blundell encouraged the "expectant" plan, which often meant that the woman was allowed to remain with the head impacted for scores of hours with an after result of vesico or recto-vaginal fistula. But Blundell never countenanced any such inactivity. However, the part of this "Meddlesome Midwifery," that properly comes within the scope of this paper is the too early and too frequent use of ergot.

When I first engaged in obstetrical practice our meddlesome faults in Canada were chiefly the following:- undue pressure over the fundus: premature rupture of the membranes; unwise digital dilatation of the os uteri; rapid extraction of the placenta; too early and too frequent use of ergot. But apart from our faults, our methods were simple, our faith in ergot was great. Instruments such as forceps were unnecessary. The usual outfit in going to a case of labour included a bottle of ergot and a long index fingernail—the latter to puncture the membranes, the former to empty the uterus..

PITUITRIN

But now, as we have come into the pituitrin era, our outfit consists of a box of ampules and a hypodermic needle. Oliver and Schaefer told us something about the extract of the posterior lobe of the pituitary in 1895. Drs. Rucker and Haskell, of Richmond, Va., gave us some interesting information about its obstetric employment in the Journal of American Medical Association, May 21, 1921. Blair Bell and Dale described its stimulant action on uterine muscular fibres in 1909 and 1910. The Germans in

1911 and 1912 discovered that "its action wsa marvellous." That of course settled the matter especially in those centres where German "Kultur" is worshipped.

The fame of pituitrin travelled with even greater rapidity than did that of ergot 100 years ago. It captured the good old conservative South, the country of Rucker and Haskell, who tell us that in various parts of the Southern States the country practitioners use it as a matter of routine in their obstetric practice. It also spread to other countries largely peopled by admirers of the German methods, Cuba, Porto Rico, South America, and-------Toronto.

About six months ago I had associated with me in a case of labour, a good physician of thirty years standing, an excellent obstetrician, and an intimate friend (Jones let me call him). The patient was in good condition, with cervix fairly well dilated and pelvic floor yielding. Jones, who was keeping the patient slightly anaesthetized, suggested pituitrin, and 1 c. c. was injected. After a time he advised a second ampule; but I said no—not now. In a few minutes after he remarked "they say that if one dose does not act within half an hour a second should be given. I never wait longer than twenty minutes." I answered "I'll not discuss the matter now, but will not give any more."

By way of explanation I may say I refused to act on Jones' second suggestion because I did not like the effect of the first dose. The uterine contractions were increased but altered in character, and the expelling force was, I thought, diminished. The os was slightly tightened, and the pelvic floor more rigid. I feared that further injection of the pituitrin would increase these evils, and though the child would probably be expelled within a limited time, there was a likelihood that with the expulsion there would be some laceration of the cervix, or the pelvic floor, or perinaeum, or all three combined, with a possible danger (perhaps one chance in a hundred or one in a thousand) of rupture of the uterus. After a time, with a little more anaesthetic administered, nature soon worked in her own safe way. The cervix again became dilated, the pelvic floor and perinaeum became softened and stretchable, and everything was ready for delivery. Then after a slight delay the forceps were applied and the child extracted slowly, carefully and easily, in perfect condition, without the slightest laceration or injury of any sort to the mother, who afterwards made a rapid and complete recovery.

In a conversation after, I told Jones the medicine had not acted well because of which I feared lacerations and possibly rupture of the uterus. He told me he had no knowledge of results so serious but had noticed bad symptoms occasionally, and controlled them with chloroform or ether. Then to my surprise and sorrow I discovered that he had acquired the pituitrin habit, and in justification thereof he informed me that obstetric authorities in Toronto, and he himself as well, had found it "perfectly safe to give eight or ten doses at half hour intervals." In the old ergot days no one ever made a more perilous statement which is all the more remarkable because many of the ablest and wisest obstetricians of North America have been telling us about the grave dangers associated with its use. Edgar, certainly second to none among the most scientific, practical and discreet obstetricians in the world, told us in 1913 (Journal A.M.A., May 11, 1913) that even small doses of the pituitary extract had caused fatal compression of the foetus, premature separation of the placenta, and even rupture of the uterus.

The following list of dangers and accidents from the use of pituitrin is rather startling:- rupture of the uterus, premature separation of the placenta, impacted face presentations, uterine tetany, laceration of the cervix, injury to pelvic floor, laceration of the perinaeum, disturbance of normal contraction causing tonic spasm of Bandl's ring with incarceration of the placenta.

The number of deaths from rupture of the uterus is so large as to be quite or almost unbelievable until one examines the records in detail. Rucker and Haskell in the paper already referred to, report over fifty cases. I have seen many reports of such casualties in Progressive Medicine, one of which in its issue of September 1, 1918, is sadly interesting. A healthy primipara, occipito-posterior position, cervix moderately dilated; four drops injected—thirty-five minutes after, five and one-half drops injected. During the second pain, the patient collapsed from rupture of the uterus, the abdomen was opened at once, the child was extracted, the patient died in two or three minutes. In this instance the amount injected in two doses was altogether only a little more than half of 1 c. c., and yet death came unexpectedly and suddenly before there was the slightest suspicion of danger on the part of those in attendance.

The numbers of fatalities from the use of pituitrin during the last six years has run far into the hundreds. We may suspect there have been gross exaggerations. Let us suppose there have been such, and that they have been ten fold (which I don't believe) we must surely conclude that the net results are terrible to contemplate.

Let me say frankly in conclusion, that the tone of this paper is quite onesided and pessimistic. I may say incidentally that I have no great admiration for the pessimist; and I think the Irishman was not far wrong when he described him as follows: "He's a feller pwhat burns his bridges behind him an' thin crosses thim before he comes to thim." I have learned so much about the evils and dangers to both mother and child of drugs which greatly increase the driving force of the uterine muscles that I may be inclined to overlook some of the good results produced by these same drugs when properly used. However, I quite realize that the three drugs mentioned have great powers for good if wisely administered. And in connection therewith I have great faith in the common sense and good judgment of the profession of Ontario, especially that portion included in the membership of this Association. Let them study the question in the light of their every day experience. I have a fixed opinion that when they have done so their decision will not be very far wrong.

A REPORT ON RECENT METABOLIC FINDINGS IN THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE THYROID GLAND*

Gordon S. Fahrni, M.D., F.A.C S.

Lecturer in Surgery, Medical Faculty, University af Manitoba

Asst. Surgeon, Winnipeg General Hospital.

THE metabolic rate or basal metabolism is the rate at which the life process is proceeding within the body and is the measurement of the minimum heat production in a person in a condition of physical, alimentary, and mental rest.

Direct calorimetry has for many years been practiced by scientists, but such a difficult procedure could not be used to clinical advantage as a routine.

Indirect calorimetry, however, as practiced more recently by the use of certain instruments, has provided a simple, yet fairly accurate, means of ascertaining the metabolic rate of an individual.

In indirect calorimetry we have the open and closed methods. Against the open method stands the objection that it is a complicated procedure

ment is a stationary apparatus which of necessity narrows its field of usefulness. The closed type of instrument has the advantage of simplicity in operation, and requires much less time for carrying out the test. In addition, a portable apparatus is satisfactory. It has, however, the disadvantage that in nervous irregular breathers there may be a slight error in the reading due to the lungs being less expanded at the finishing time than at the point of commencement or vice versa. This irregular breathing can usually be detected by an observant operator and by running the test for a longer period of time than usual, the error can be greatly reduced.

The basis of the test is the rate of oxygen consumption by the cells of the body, and if the sary unless a very delicate reading is required and accordingly the more simple and commonly used instruments base their findings on the rate of oxygen consumption alone.

The usefulness of basal metabolism estimation from a clinical point of view has become so well established that it needs no defence by me. Its chief field of usefulness is in diseased conditions of the thyroid gland.

In 1895. Magnus Levy was the first to demonstrate an increase of metabolism in hyperthyroidism and a decrease in myxoedema. Since then. Hirschloff. Bergman. DuBois. Means, Benedict. Plummer, Boothby and many others have done much work on this subject with the result that the thyroid gland has been shown to govern very closely the rate of body metabolism, an increase in the thyroid activity causing an increase in rate of metabolism, while a decrease in thyroid activity causes a lowered rate of metabolism.

There are other conditions in addition to disordered function of the thyroid which cause the metabolic rate to deviate from normal. Chief among those increasing the metabolism are fever of any kind. lymphatic leukaemia, pernicious anemia, acromegaly and acute diabetes with acidosis, while the disorders that decrease metabolism are chiefly hypopituitarism, diabetes with marked emaciation, starvation and wasting disease.

It is therefore necessary in interpreting readings of abnormal metabolic rates to exclude such conditions as these before laying the cause at the door of the thyroid. It is to be remembered, however, that a reading higher than plus 40 or lower than minus 20 is usually thyroid in origin, any variation of the rate from normal in the other diseases mentioned, usually falling within these limits.

The value of basal metabolism in disease of the thyroid gland is the subject matter of this paper, and the conclusions arrived at are based on 125 different metabolic readings done on 105 different persons between April, 1921, and December 31st, 1921, together with at least a superficial clinical study of the case. All patients included in this series were suffering from a pathological condition with symptoms suggestive of thyroid disease. Quite a number of the series were my own cases and these I was able to follow throughout their illness. The balance of the series were cases referred by their attending doctor to me for basal metabolism estimation and in this group I have been unable to draw any conclusions in regard to the progress of the case after diagnosis. i.e; during the period of treatment. In interpreting the results I have considered any reading between minus 15% and plus 15% as normal at the same time becoming suspicious of a minus 15% rate and advising second or third readings at intervals of a few days. On the other hand any reading between plus 15 and 20% was not considered as definitely due to hyperthyroidism and wherever possible second and even third readings were obtained, and where persistently above plus 20% a cause should be carefully looked for. A few of these mild cases of hyperthyroidism I found to exist in young women, with apparently simple colloid goiter of puberty or adolescence which no doubt were mildly activated.

These results I will take up under two headings, viz: value of basal metabolism in (1) Diagnosis. (2) Treatment.

(1).—*Value in Diagnosis.*

In this series of 105 persons, 38 cases or 36.19% had normal metabolic rate, 62 cases or 59.09% had abnormally high metabolic rate, while 5 cases or 4.76% had abnormally low rate.

(*a*) In analyzing the group of 38 cases with normal metabolic rate we find that the final diagnoses come under the following heads in order of frequency.

Final Diagnosis;	*The reason for suspecting metabolic disturbances*
(1) Nontoxic goiters of different types.	Enlarged thyroid gland.
(2) Psychoneuroses.	Coincident goiter, nervousness, weakness, easily tired, etc.
(3) Obesity and mental defectives.	Sluggish mentality, loss of hair, oedema and other symptoms of myxoedema.
(4) Incipient tuberculosis.	Tachycardia, loss of weight, hyperhydrosis, asthenia with or without struma.
(5) Essential hypertension.	Arterial hypertension with or without struma.
(6) So-called goiter wreckage cases.	Broken down circulatory or sympathetic system or both with a history of long-standing goiter.

In this group of cases, suspicious clinically of thyroid disease, but with normal metabolic readings, we find conditions of disease which have never been related in any way to the thyroid gland as well as conditions of disease which are the result of old hyperthyroidism although the thyroid gland has long since ceased to hyperfunction. I refer here more especially to the goiter wreckage cases, the gland having long since "burned itself out," so to speak, leaving as the result, a broken down circulatory or sympathetic nervous system which, because of organic changes, are permanent disabilities.

Without the basal metabolism. in many of these cases, one is at a loss to proceed with treatment, whether for suspicious hyperthyroidism which may be neurasthenia, or incipient tuberculosis with simple thyroid enlargement, or for suspicious myxoedema.

Should thyroid therapy, whether medical or surgical, be proceeded with in these cases incorrectly diagnosed, the patient is the sufferer, the doctor condemned, and legitimate thyroid therapy discredited. It therefore behooves us first of all to make sure hyperthyroidism exists before we attempt to reduce it and also to be quite sure hypothyroidism exists before thyroid feeding is begun. Nothing can do this more dramatically than carefully done metabolism estimations.

(*b*) In analyzing the group of 62 cases with hyperthyroidism, I feel convinced that many could not have been diagnosed definitely without the knowledge of existing basal metabolism. Many cases of arterial hypertension of previously unknown origin have been shown to be due to hyperthyroidism usually of the type secondary to toxic adenoma of the thyroid.

A striking feature has been the frequency with which hyperthyroidism exists with certain of the previously thought constant signs or symptoms absent such as, no apparent enlargement of the thyroid gland or the symptoms largely referable to the circulatory system. Furthermore the degree of hyperthyroidism does not in all cases correspond with the clinical picture. For instance, with very marked symptoms the metabolic rate may be found to be only moderately increased, while in some cases the metabolic rate has been found to be much higher than the signs and symptoms would indicate. As a rule however, the two conform with fair regularity .

The basal metabolism is especially valuable in diagnosis where hyperthyroidism supervenes during the course of another disease such as following operation for some other condition or during pregnancy or immediately following child birth. The clinical picture may be alarming and the tendency is to look for the cause in some complication of the disease under treatment, operation or confinement as the case may be; the thyroid probably not being at first suspected. In this connection I recently saw a patient a few days after her confinement in consultation with the obstetrician. Immediately following a difficult labor she had become extremely ill, vomiting, intractable diarrhoea. very nervous, tossing about in bed. pulse very rapid, and fever from 99 to 102.F. with hyperdrosis. The natural conclusion to arrive at first was puerperal infection, even in the face of an existing enlarged thyroid which had been present many years with little inconvenience so far as she knew. She had a very high metabolic rate which, with physical findings, proved beyond doubt the cause of the unexpected disturbance. The obstetrician was suspicious of the thyroid in this case before I saw the patient.

(*c*) In the third group, that of hypothyroidism, I found five very definite cases of myxoedema, three males and two females: this order is usually reversed, myxoedema being more common in females. There was no familial tendency in this group of five, and the origin was apparently spontaneous, with no history of degenerative or inflammatory disease of the thyroid gland nor of operation on the gland.

This disease is simulated very closely by other conditions and on several occasions cases have presented themselves with certain symptoms which suggest myxoedema but basal metabolism has been normal. In such cases no good and a great deal of harm may be done by the injudicious administration of thyroid extract. In this connection I recently examined a patient being treated for myxoedema who had a basal metabolic rate of plus 48%, was nervous and steadily losing weight. This patient probably had had no thyroid disturbances and the thyroid feeding had produced a degree of hyperthyroidism. Quite frequently too. the basal metabolism may be asked for in cases suspected of myxoedema during a period of active thyroid feeding and a normal or higher than normal rate may be obtained. In these cases in order to find out the exact degree of hyperthyroidism without treatment, they must be left about three weeks in order to give time for the products of the artifically fed thyroid to be entirely eliminated from, or consumed by, the body.

(2) *Value of Basal Metabolism in Treatment of Thyroid Disorders.*

Having definitely established the existence of hyperthyroidism or hypothyroidism we have now to decide upon and carry out treatment which will be of the greatest benefit to the patient and carry with it the least danger.

(*a*) *Hyperthyroidism*—These cases if treated medically or by rest, diet, or radiotherapy should have their metabolic rate taken at intervals, this being the most reliable index to the improvement or aggravation of the disease. Especially is this so in X-ray treatment where it is to be remembered that Roentgen rays may for a time stimulate the thyroid tissue, but soon degenerative reaction takes place and if overdosage is practiced, such a degree of destruction of thyroid epithelium may occur as to cause hypothyroidism. This can best be guarded against by frequent metabolism readings.

Should operative interference be practiced, it is important to institute such procedure during a remission rather than during an exacerbation of the disease. Furthermore, following operation, it is very instructive to note the fall in metabolic rate. In thyroid ligations the drop in metabolic rate in my cases averaged from 15 to 40 per cent., and following thyroidectomy the metabolic rate quickly dropped to normal or almost to normal with three weeks after operation. The ligations apply to Graves' disease alone and only the severe forms of this disease were first ligated. The metabolic readings were noted two to three months following double ligation. The normal readings following thyroidectomy refer to all toxic goiters so treated. If the metabolic rate can be so reduced following thyroidectomy in these toxic goiters, surely we have in surgery a form of treatment of great value in this disease.

Eberts recently has reported a series of twelve cases, seven Graves' disease and five toxic adenoma, in which the metabolic rate quickly dropped to normal or almost normal following operation in each case.

(*b*) In myxoedema it is important that the low basal metabolism be increased to normal and the most accurate guide to this end is careful metabolic studies at intervals during early treatment until it is ascertained just how much thyroid extract or dried gland is required to keep the body functions normal. And in this manner over or under dosage is prevented. It is to be remembered too, that the normal thyroid gland of animals has a very definite seasonal variation in iodine or thyroxin content. In January, February, and March, the thyroxin or iodine content is much lower than in midsummer, so that an animal's gland taken at this season will be much less potent than a gland taken in midsummer, and in this way, an error in standardization of potency of the preparation used may creep in, indicating the need for all the more careful checking of basal metabolism during treatment.

Conclusions.

With a view to making medical practice an exact science the introduction of indirect calorimetry into the field of thyroid disease has done much. In the differential diagnosis of both hyperthyroidism and myxoedema as well as in their treatment, metabolic studies are invaluable. Basal metabolism must not, however, be used in any manner to the exclusion of the clinical findings and history, but these three should be inseparably associated in the diagnosis and treatment of thyroid disease.

The Schoolchild Before and After Tonsil and Adenoid Removal.—After examining about 7,500 children, LITTLETON DAVIS, Roanoke, Va. (Journal A. M. A., April 22, 1922), is convinced that the incidence of heart disease in the great number of children referred for tonsil operations is very small. The cervical glands enlarge as often after as before tonsil removal. There is more complete relief from symptoms when removal is done at from 7 to 10 years of age, in the majority of cases. Early removal gives mechanical relief for a time; but the original cause of the growths, whatever it may be, is present and active until a much later period.

INTESTINAL OBSTRUCTION*

H. W. Riggs, M.D., C.M., F.R.C.S. Edin. F.A.C.S.

INTESTINAL obstruction continues to be the *bete noire* of the medical profession. Advances most marvellous have been made in other lines, and by careful diagnosis and better technique the results have been improved so as to make operation a comparatively safe procedure. But for intestinal obstruction, the mortality rate remains exceedingly high—I wish to quote figures from an open hospital, where the men attending are at least of average medical intelligence.

Series of 31 Cases

Sex—Males, 24; Females, 9

Cause of Obstruction		*Ultimate Result*	
	Number	Recov'd	Died
Not stated	4	—	4
Intussusception	5	3	2
Bands—Primary	3	—	3
Secondary to Op.	6	2	4
Volvulus	1	—	1
Hernia—strangulated	12	8	4
Mortality without operation		3	1
" of operated cases		12	15
" of " "		55 5%	
Days intervening between onset and operation:			
Fatal cases	3½		
Recovered	1 5-6		

When the results as here given are considered, it must be acknowledged that in the treatment of this disease we have not made much advance. Let us compare with other series which have been collected:—

McGlannan in 1915 published a series of 276 cases, with a mortality of 45.7% and Finney in 1920 a series of 245, of which 217 were operated on, with a mortality of 36%. These include chronic obstruction as well, and so cannot be fairly compared with the percentages given in this series, which are of the acute type.

In these few cases it is interesting to point out that strangulated hernia forms 40% while obstruction from secondary bands is 20% of the total. These are in a measure preventable diseases. McGlannan points out in his series of 276 that 10% had followed drainage in appendix operations; thus early operation in appendicitis

In this series 6 cases or 20% are secondary to operation. Both McGlannan and Finney give 40% of post operation cases in their series. This cause of obstruction is less to-day. Our series is of the last 3 years, while Finney's is for 10 years. During the 8 years from the beginning of his series and the beginning of this, there has been great improvement in the toilet of the peritoneum and consequently fewer adhesions. Greater care in covering raw areas, lessened handling of intestines during operation, fewer packs or sponges placed in the abdomen, and probably some change in material, with less abrasive qualities than gauze, will still lower the percentage of post operation intestinal obstructions. Therefore in looking over the series, we find that there is 60% of the cases which we may put into the preventable class; and as surgeons we should endeavour, by education of the public and by greater care ourselves in the conduct of operations, to eliminate this large group.

Again, in going over these figures, one is struck by several points. First, that of all bowel obstructions, the safest to have is strangulated hernia, 66% recovering. The next is the effect of the time intervening between the onset and operation on the result, where the time was short, average 1 5-6 days, the patient recovered; while, with an interval of 3½ days, the illness proved fatal.

Evidently it is early diagnosis of the visible and palpable form of obstruction and the later diagnosis of the invisible, which determines the mortality. One, because the trouble which can be seen and felt by the physician or surgeon is treated as an emergency operation; while, in the other variety, much time is wasted in endeavouring to prove by means of purgatives and enemas that an obstruction exists. What is needed apparently is a pathognomonic syndrome, or, if such exists, more drill in education on this point. Is there such a syndrome? The history usually is a sudden attack of abdominal pain, The abdomen is soft and temperature and pulse normal. Palpation of the abdomen may elicit tenderness, and sometimes the patient can point to the exact spot of the obstruction. Such is the early picture in obstruction. As time passes, the abdomen becomes more and more distended. Acute pain ceases and there is left just the undertone or steady ache, while vomiting now has become more regurgitation; the patient is more comfortable in a way but feels extremely sick; the temperature remains normal and pulse may be normal or gradually increase in rate and become lower in tension. So far I have not mentioned bowel movements, because I think this is the point that many men stumble over. Instead of relying on the picture as given above, purgatives are given, or, if suspicions are aroused, enemata may be the only means employed to produce a bowel movement. An important point is that with the small bowel most frequently involved, there is fæcal material in the colon and this comes with the first or second enema, confusing the issue, and much time is lost, so that the patient has gone far into the second stage before a diagnosis is made. The third or terminal stage is characterized by distension, regurgitation of vile smelling brown fluid, absence of pain, a weak thready pulse, parched tongue and general mental indifference to surroundings—in other words the final stage of an intoxication.

Such is a brief outline picture of the three stages. The diagnosis should be made in the first stage. The syndrome is typical, sudden onset, especially after a meal or exertion; increasing waves of pain followed by vomiting with relief, together with normal pulse and temperature, and soft abdomen without tender areas. Such a picture watched over a period of a few hours is sufficient on which to make a diagnosis without waiting for bowel movements, but if added to this history there is beginning distension without rigidity, the diagnosis is very plain. If there is a history of previous abdominal operation, or of attacks of inflammation, it is additional support to the diagnosis. Care must be taken not to overlook a history of rupture which may have strangulated and then have been reduced *en bloc*.

Pathology

In discussion of the pathology and its relation to the symptoms, all are agreed on the main features. The sudden involvement of a portion of the bowel, together with the violent efforts on the part of the intestine to force a passage, so interfere with the sympathetic nervous system that collapse occurs. The intensity of this may lessen after the first shock but remains throughout and is later merged into the toxicity. In some cases the toxicity occurs very early, while in others there is very little absorption even after 5 days of obstruction. Brooks has shown by experiment that an occluded loop of bowel with normal blood supply and intact mucous membrane may contain at least 200 times the lethal dose, and yet the animal live for many days, and Kocher in 1899 pointed out the fact that in the mucosa of obstructed intestine there were tiny ulcerations. Other experiments, together with clinical observations, lead us to conclude that there is no absorption until the mucous membrane has been damaged. This injury in many cases is due to interference with the blood supply. Strangulation of a loop means damaged mucosa and early absorption of the contained toxins. The portion of bowel proximal to the obstruction is subject to violent peristalsis, becomes congested, and small hæmorrhages occur, either because of the excessive muscular movements or because of a combination of congestion, increased peristalsis, and increasing distension, which in itself interferes with the blood supply. The breaking down of the mucous membrane now allows absorption in this portion of the intestine, and the toxic symptoms increase rapidly.

The nature and source of this toxin has been the subject of much experiment. Whipple and his colleagues believe it to be a perverted secretion of the intestine. Murphy, Vincent and Brooks think that bacterial action on the intestinal contents is the cause; while in a recent publication Eisberg endeavours to prove by experiments that in upper intestinal obstruction, at least, the toxin is due to a breaking up of the pancreatic juice. More work will have to be done on this question before it can be decided definitely. Clinically it is a well-known fact that the higher the obstruction the more intense the collapse and the earlier the toxic symptoms.

Vomiting is at first a reflex act, but after the intestine becomes distended it is the overflow of the secretion following congestion, and is of a brownish ill-smelling fluid, but not fecal. Naturally the higher the obstruction, the earlier this form of vomiting begins.

Treatment

In dealing with treatment one must differentiate between the early case and the late case.

In the early case, *i.e.* while pains are fairly constant and vomiting is a reflex act, it is sufficient to relieve the obstruction. Seldom in this stage will anything more be necessary than to release the bowel from the constriction. Occasionally when the blood vessels have been involved, resection may be necessary.

The late case, and by that I mean the case in which spasmodic pain has ceased—and regurgitation has taken the place of vomiting—must be treated quite differently. Here the first problem is to release the bowel. This I believe is essential, and as a rule not a long task. After the obstruction is relieved, the bowel may or may not need resection, or, if the condition of the patient is bad, the loop of bowel may be brought out of the wound. An enterostomy must be done whether the loop of bowel is gangrenous or not. It is in this one part of the treatment that lies the success or failure of the case. The portion of the bowel above the obstruction is distended with gas and toxic fluid, and, in addition, it is suffering from more or less muscular and nerve exhaustion. The average abdominal case suffers from a lessened peristalsis as the result of the disturbance of abdominal pressure. The obstruction case is already suffering from lessened peristaltic power, and the handling of the operation increases the trauma so that the patient rapidly absorbs the poison and succumbs. In order to avoid this, the insertion of a Paul's tube is advocated, so that the pressure from the interior of the bowel may be relieved, and then pituitrin or eserine may stimulate the peristalsis so that the bowel above will clear itself. The necessity for this was emphasized in a recent case. A patient with a strangulated hernia of 3 days' duration, vomiting dark brownish fluid, was operated on, and because there was very little distension, a tube was not put in. Immediately following the operation, the bowels began to distend and vomiting continued until death. A Paul's tube might have saved this patient.

Sometimes enterostomy without relieving the obstruction has been advocated. In a case operated on 5 days after obstruction, this was done, and although the distension and vomiting disappeared, the patient died with the usual toxic symptoms. At autopsy there was found a loop of bowel about 8 inches long caught by a band, almost gangrenous and quite distended. The toxic absorption from this loop acted just the same as if the whole upper portion of the bowel were suffering from ileus. Therefore, if a loop of bowel is involved, it is best to relieve the obstruction before doing the enterostomy. This rule does not obtain where there is but a single constriction of the bowel, as in a constricting band, kink or tumour.

These obstruction cases on account of the vomiting and lack of fluid intake, are dehydrated, and so during operation 300—500 c. c. of 3% glucose in saline is run into the vessels. This is followed after operation by another 300 either interstitially or intravenously. By this means it is hoped to overcome the fall of blood pressure and to increase the elimination of poison.

The means used to empty the bowel of its toxic contents vary. Some advocate stripping the bowel during the operation. This has the disadvantage of increasing the trauma, although this may be offset by getting rid of the poisons, and the relief of distension so that the muscular tone of the bowel is more rapidly restored. In cases where this procedure is unwise, eserine or pituitrin may be used following the operation. In some cases these act well.

Recapitulation

First—Because of late diagnosis, many cases come too late for operation.

Second—The syndrome, of sudden onset with waves of pain coming to a climax and accompanied by vomiting, followed by relief, lax and non-distended abdomen and normal pulse and temperature, is pathognomic.

Third—Valuable time is lost in trying to make a diagnosis by enemata.

Fourth—Early cases, with spasms of pain and vomiting, need only the relief of the obstruction.

Fifth—Late cases with cessation of spasmodic pain, and with regurgitation, require enterostomy as well as relief of obstruction.

Sixth—Strangulation of bowel by interfering with blood supply increases the toxicity and the operation risk.

Seventh—Dehydration and toxicity must be overcome by subcutaneous or intravenous saline, preferably containing glucose.

Eighth—Above all, early diagnosis is essential or better results

CREATINURIA IN CERTAIN DISEASED CONDITIONS*

A. T. Cameron, F.I.C., F.R.S.C., and A. Gibson, M.B., F.R.C.S., F.R.S.E.

Winnipeg

IN a case of abnormal muscular development, recently described (1), the outstanding features were musculature presenting infantile characteristics, and persistent creatinuria. This has led to investigation of certain other cases where muscular involvement was a prominent feature, in order to see what relationships exist between creatinuria and (*a*) absence of muscle, and (*b*) presence of degenerating muscular tissue (*i. e.* the gradual disappearance of muscle mass).

We give first a short resumé of the case of muscular infantilism already referred to, secondly, details of further cases studied, and thirdly, a summary of the facts already established regarding creatine metabolism along with the bearing of our new evidence upon these.

Muscular Infantilism.

R. W. T., male, 30, single, height 68 inches, weight 70 kg., has been unable all his life to perform any action calling for much muscular effort. Provided the muscular work required was small in intensity the effort could be maintained for a normal length of time. His condition is hereditary, dating back at least as far as his father's grandmother, and affecting both males and females (about 55 per cent. and 33 per cent. respectively).

The patient was under observation from September 1917 till December 1920. Chemical investigations were made from March to November 1920. Physical examination reveals no departure from normal save that the muscles of the upper limbs are somewhat small in bulk, with correspondingly small bones. There is very slight thyroid enlargement, but no sign of hyperthyroidism. The physical condition did not vary to any appreciable degree throughout the whole period of observation. Clinical findings as to low grade of musculature were confirmed by dynamometer and ergograph measurements, both suggesting an infantile condition, rather than a degenerative process. Repeated examination over the long period of observation demonstrated that *there is absolutely no suggestion of any process of muscular wasting.* Examination revealed no abnormality in the nervous system. Histological examination of muscular tissue showed nothing abnormal.

Gymnastic exercises made no appreciable difference to muscular power. Experimental administration of adrenal gland, of thyroid, of pituitary, and of strychnine produced no striking alteration. The small variations in power which resulted are described in detail elsewhere.

While it is obviously impossible to give more than a rough idea of the muscle volume of such an individual, especially since in his case there was a tendency to general adiposity except in the upper limbs, yet we are of the opinion that an approximate figure would be about 75 per cent. of normal.

The only chemical abnormality is the constant presence of creatinuria. None of the treatments attempted while chemical examinations were being made caused decrease of this, except thyroid administration. This, prolonged, caused decrease of creatinuria, accompanied by increased muscular weakness and marked increased acidity of urine of unascertained origin.

Blood sugar and creatinine were normal.

Roughly speaking, the ratio of creatine to creatinine in urine was as 1.3. The creatinine cœfficient was distinctly below normal, but total creatine plus creatinine (1.3 to 1.5 gms. per day on a meat-free diet) gave a figure approximately that for creatinine alone for an individual of his weight and build.

Examination of three-hour urine samples throughout the day and comparison with the succeeding nine-hour night sample showed no diminished creatinuria during the night, and a slight tendency to increase with increased H-ion concentration of the urine. The degree of creatinuria during short periods seemed to depend upon the degree of urine excretion. R. W. T forms creatine at a fairly constant rate through-

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out the 24 hours, the amount removed from the blood depending on the amount of urine excreted.

Creatinuria in various conditions.

Table I shows urine creatine and creatinine contents for a number of normal boys (examined for comparison with R. W. T.) and for a number of cases in which occur different types of muscular involvement. Table II shows similar figures at various periods following amputation. Brief case reports are given.

Creatinine was estimated by the Folin method, creatine by the Folin-Benedict method. The figures for creatine are expressed in terms of creatinine.

Case Reports Tables I and II (see opposite page). Nos. 1 to 6 were all normal children.

Spinal Sclerosis.

No. 7—A. B.—Male—13—Onset 3 years previously with inability to rise on toes and persistent stumbling. Family history very pronounced. Family consists of 11 children, of whom several, both male and female, are affected in the same way with onset at about the age of 10. Father's brother also has a family of 11 children of whom several are affected with the same disease coming on at the same age. There is no record of the disease in the father's family on the paternal or maternal side. Patient walks with a shambling gait. The knees are kept bent, and the foot is kept flat on the floor. There is marked atrophy of both calves, the circumference being only 10 inches. Marked bilateral Babinsky, ankle jerks normal, knee jerks markedly increased. Cremasteric and epigastric reflexes present. Feet are tending to become hollow. The peronei are quite inefficient on both sides.

(This boy lives some distance off in the country and has not been available for prolonged study.)

Poliomyelitis.

No. 8—C. C.—Male—16—Onset at age of 2. Paralysis practically complete in both lower limbs from the waist down.

Congenital Diplegia (Little's Disease).

No. 9—M. B.—Female—16—Marked spasm of the adductors and the calf muscles. Walks on the tips of the toes with the thighs closely approximated.

Progressive Muscular Atrophy.

No. 10—D. M.—Male—28—Onset 4 years before while carrying a stretcher in France. Gradually increasing weakness of the left hand until at present there is complete wrist drop. No sensory loss. No evidence of cervical rib. Condition progressing and is involving the muscles of the upper arm. History of infection with syphilis Wassermann negative after treatment.

No. 11—R. M.—Male—34—Onset 6 months previously with cramps and stiffness in the left hand. Shows atrophy of the left forearm, marked atrophy of the pectoralis major and deltoid, and of the other shoulder muscles. Previous illnesses unimportant; family history negative for nervous disease. Wassermann negative.

No. 12—H. S.—Male—47—Onset 4 years previously, with pain in the back and shoulders. One cousin on the mother's side affected. No previous illnesses of note. Wassermann negative. Pronounced affection of the muscles of the back of the neck, of both shoulder girdles, of arms, and forearms, but the muscles of both hands are but slightly affected. In the lower limbs only the tibialis anticus on the left side shows any marked degree of wasting. Condition when examined was fairly rapidly progressive.

Acute Sciatica.

No. 13—J. S.—Male—42—Onset suddenly about 2 months before. Attack has been fairly severe; cause not ascertained. Teeth. X-Rayed, healthy. Tonsils not at fault. Appendix removed 4 years before. No venereal infection. Distinct but not extreme wasting of the muscles of the right thigh and right leg.

Complete Sciatic Nerve Lesion.

No. 14—J. A.—Male—22—Gunshot wound of the right upper thigh. Operation for suture of the right sciatic nerve July 1920. Partial recovery, but very incomplete. Trophic ulcer over the external malleolus.

Tuberculous Knee Joint.

No. 15—R. V.—Male—22—Occupation, chiropractor. Onset one year before. Discharging sinus for 8 months. Operation for excision of the knee-joint August 4th, 1920. Bone was extensively affected and there was marked involvement of the synovial membrane, and of the bursæ around the knee-joint. There is distinct atrophy of the muscles of the right thigh and of the right calf. (Subsequently there has been a distinct improvement. Muscu-

TABLE I.

CREATINURIA IN VARIOUS CONDITIONS

No.	Sex	Age Years	Condition	Diet	Date	Creatinine		Creatine	
						mg. per 100 c.c.	gm. per day	mg. per 100 c.c.	gm. per day
1.—D. O.	Male	3 6	Normal	Normal	29 Oct., '20	114	....	17	....
2.—C. O.	"	6 3	"	"	29 Oct., '20	100	..	56	....
3.—J. C.	"	7	"	"	24 Oct., '20	64	..	15	....
4.—H. S.	"	8	"	"	23 Oct., '20	39	.	16	....
5.—E. B.	"	9	"	"	22 Oct., '20	96	.	0	....
6.—Z. S.	"	12	"	"	23 Oct., '20	106	.	0	..
7.—A. B.	"	13	Spinal Sclerosis	"	20 May, '20	..	0.41		0.24
8.—C. C.	"	16	Poliomyelitis	"	6 Nov., '20		1.00		0.86
9.—M. B.	Female	16	Congenital Diplegia	"	6 Nov., '20	.	1.11	.	0.78
10.—D. M.	Male	28	Progressive Muscular Atrophy	"	29 Aug., '20		1.41		0.16
11.—R. M.	"	34	" " "	"	14 Oct., '20	.	1.20		0.37
12.—H. S.	"	47	" " "	"	5 May, '20		1.62		0
					11 June, '20	....	1.58		0.21
13.—J. S.	"	42	Acute Sciatica	"	14 Oct., '20	...	1.75	.	0.21
14.—J. A.	"	22	Sciatic Nerve Lesion	"	9 Nov., '20	...	2.70		0.22
15.—R. V.	"	22	Tuberculous Knee	"	6 Nov., '20	....	1.15	..	0
16.—G. G.	Female	35	Emaciation	"	11 Sept., '20	....	0.16	..	0.07
					24 Oct., '20	...	0.48	.	0.09
17.—M. S.	"	17	Infantilism	"	27 Sept., '20	....	0.17	...	0.34
18.—Ir. N.	"	3	Congenital Spinal Spastic Parapl.	"	25 Sept., '20	....	0.13	..	0.17
19.—Id. N.	"	7	" " " "	Meatless	25 Sept., '20	...	0.25	..	0.24
20.—J. N.	Male	42	" " " "	"	Oct., '20	....	1.11	...	0.28

TABLE II.

CREATINURIA AFTER AMPUTATION

No.	Date of Amputation	Nature of Amputation	Date of 24-hr. Sample	Period since Amputation	Diet	Volume	Creatinine	Creatine	Total	Present Weight	Build	Creatinine Limits	Probable Creatinine
				days		c.c.	gm.	gm.	gm.	kg.		gm.	gm.
21 W.M	Nov. 5 1920	Left Arm	5 Nov., '20	0	Normal	1240	2.13	0.32	2.45	79	Stout	1.6	1.7
			6 Nov., '20	1	"	710	1.43	0.08	1.51			to	
			15 Nov., '20	10	"	1150	1.76	0.22	1.98			2.0	
			16 Nov., '20	11	Meat-free	—	—	—	—				
			17 Nov., '20	12	"	1170	1.58	0.46	2.04				
22 J. A.	Oct. 9, 1920	Leg 6 in. below knee	14 Oct., '20	5	Normal	1135	1.73	0	1.73	67	Medium	1.3	(1.5)
			6 Nov., '20	28	"	(100)	(0.18)	(0.012)				to	
			15 Nov., '20	37	"	920	1.80	0.46	2.26			1.7	
			16 Nov., '20		Meat-free								
			17 Nov., '20	39	"	1355	1.71	0.16	1.87				
23 J. C.	Oct. 22 1920	"	4 Nov., '20	13	Normal	1350	2.71	0.33	3.04	(60)	Lean		1.5)
			5 Nov., '20	14	"	930	1.36	0.31	1.67				
			15 Nov., '20	24	"	840	1.58	0.20	1.78				
			16 Nov., '20	25	Meat-free								
			17 Nov., '20	26	"	790	1.73	0.64	2.37				
24 J. Fa.	Apr. 16 1920	Leg 5 in. below knee	15 Nov., '20	213	Normal	940	1.27	0.14	1.41	58	Lean	1.15	1.15
			16 Nov., '20		Meat-free							to	
			17 Nov., '20		"	1200	1.42	0.64	2.05			1.45	
			26 Nov., '20		"								
			27 Nov., '20		"	1700	1.33	0.20	1.53				
			28 Nov., '20		"	890	1.25	0.17	1.42				
25 J. Fo.	May 5 1917	"	15 Nov., '20	3	Normal	1085	1.87	0	1.87	70	Medium	1.4	1.6
			16 Nov., '20		Meat-free							to	
			17 Nov., '20		"	1580	1.98	0.17	2.15			1.75	
			25 Nov., '20		"								
			26 Nov., '20		"	1880	2.22	0	2.22				
			27 Nov., '20		"	1020	1.33	trace	1.33				
26 J. H. C.	1896	Leg 8 in. below knee	28 Nov., '20 plus 29 Nov., '20	24	Normal	(1800)	(1.13)	0.24)	1.37	(70)	Spare		

larity has been to some extent re-established, following upon the operation).

Emaciation.

No. 16—G. G.—Female—35—Has never menstruated. Weight 52 pounds. The outstanding features are extreme emaciation, childishness, and some delusive formation. This is reputed to have followed an attack of influenza. An X-Ray of the skull showed an extremely small sella that is completely closed in by the clinoid processes. The weight when the second sample was obtained had increased to 59 pounds, and there was general improvement. Since that time there has been still further improvement.
(We are indebted to Dr. A. T. Mathers for the material and report on this case).

Infantilism.

No. 17—M. S.—Female—17—Never menstruated. Height 48 inches. Weight about 23 kg.

Congenital Spinal Spastic Paraplegia.

No. 18—Ir. N.—Female—3—Marked spasticity of adductor muscles and superficial calf muscles.

No. 19—Id. N.—Female—7—Marked spasticity of all muscles of both lower limbs.

No. 20—J. N.—Male—Father of Nos. 18 and 19. Walks with crutches and tripod gait. Marked spasticity of all muscles of both lower limbs.

Amputations.

No. 21—W. M.—Male—Adult—Gunshot wound left arm, compound fracture of humerus on March 12th, 1918. Complete lesion of musculospiral nerve. Operation for suture of musculospiral nerve. February 28th, 1919. Several attempts at bone-graft unsuccessful. Amputation just above the elbow, November 5th, 1920. Weight before amputation, 83 kg.

No. 22—J. A.—Male—29—Gunshot wound of the leg. Numerous operations in attempt to save leg. Amputation October 5th, 1920.

No. 23—J. C.—Male—26—Gunshot wound of the right buttock. Complete lesion of the right sciatic nerve about the great sciatic notch. Hip-joint and knee-joint ankylosed. Amputation below the knee-joint October 22nd, 1920.

No. 24—J. Fa.—Gunshot wound, left buttock, October 9th, 1918. Damage to left hip-joint causing bony ankylosis and complete lesion of sciatic nerve. The sciatic nerve was explored on August 15th, 1919. It was found completely destroyed at level of great sciatic notch. Trophic ulcers developed. The left leg was amputated below the knee on April 16th, 1920.

No. 25—J. Fo.—Gunshot wound in right leg on October 1st, 1916. Amputation five inches below the knee on October 5th, 1917.

No. 26—J. H. C.—Male—55—Amputation 8 inches below knee, 1896. Weight about 160 pounds. (Not a patient).
(We are indebted to Capt. F. C. Wilson, C.A.M.C. for dietetic control of and collection of material from cases 21-25).

Creatine Metabolism and Creatinuria

Critical examination of the large amount of experimental evidence now available dealing with various phases of creatine and creatinine metabolism permits certain definite statements.

Normal creatinuria.

Creatine is a normal constant constituent of the urine of infants and young children, of most if not all young animals, and of some adult animals (cattle, goats, sheep, foxes, coyotes) and its presence is independent of creatine in the diet. It normally occurs in the urine of girls till puberty, and occasionally in that of human adult females even on a creatine-free diet, of bitches, and of female rabbits. The creatinuria bears no clearly defined relation to the sexual cycle in women, but it is constant in pregnancy, and is a concomitant of lactation. It is at a maximum in bitches five days after parturition.

Normal male human urine usually contains no creatine, though traces may be present in some individuals on a normal (not creatine-free) diet. It is not present in the urine of adult male guinea-pigs, monkeys, or rabbits. It is present in the urine of eunuchs castrated before puberty.

Distribution of creatine.

Striped muscle contains 0.3 to 0.5 per cent., heart-muscle 0.2 to 0.3 per cent., smooth muscle considerably less, testes over 0.1 per cent., while amounts of a smaller order are present in other body tissues. Cow's milk contains estimable amounts, probably of the same order as those in blood. Human blood contains about 0.3 mg. per 100 c. c., chiefly present in the corpuscles; the plasma only contains traces. The average amount is somewhat greater in females, and there is a distinct correspondence between increase of plasma creatine and appearance of creatinuria.

Distribution of creatinine.

Muscle contains distinct traces of creatinine. The amounts, about 6 mg. per 100 gm., are greater in muscle than in other tissues, and in blood. Heart muscle contains more creatinine though less creatine than skeletal muscle.

Creatinine normally occurs in mammalian urine. On a meat-free diet its amount is relatively constant for man, and bears a definite ratio (Folin's creatinine-cœfficient) to the body-weight (19 to 24 mg. per kg.). It is doubtful whether on a creatine-free diet the excretion of creatinine is entirely independent of the amount of protein ingested.

Effects of diet.

Feeding creatine by the mouth in amounts less than one gm. does not induce creatinuria in normal adult man. When larger amounts are fed, part is excreted in the urine unchanged; 20 per cent. of a 5 gm. dose, and over 60 per cent. of a 20 gm. dose, while a definite small proportion appears to be converted into creatinine. Similar results are obtained after subcutaneous injection. Part of the creatine cannot be accounted for, though bacterial action probably is responsible for some loss, when it is given orally, while a small part of the injected creatine appears to be stored in muscle.

The effect of feeding creatine to children is more marked; smaller amounts induce or increase creatinuria. The younger the child the more of the injected creatine is excreted unchanged, even a dose of 0.1 g. being largely recoverable in the urine.

Feeding or injecting creatinine never gives rise to creatinuria. Most of such creatinine is immediately excreted.

Meat in the diet causes increased creatinine output in man, and sometimes some degree of creatinuria, probably due in part to the creatine (and creatinine) in the (cooked) flesh. A high protein diet freed from creatine does not produce creatinuria in man, but may do so in women, and invariably does so in children.

Feeding certain corn products (starch, linseed meal, gluten meal) to pigs produces marked creatinuria. Others, equally rich in proteins (cornmeal) produce only slight traces.

It would appear therefore that *although much of the creatine excreted is derived directly from food, yet in young children and other young animals, to some extent in women, and continually in certain other mammals, creatinuria occurs which cannot be entirely traced to preformed creatine in the food; but is almost certainly due to creatine derived from protein sources, i. e., formed in the body from amino acids*, indicating that some, if not all, of the creatine found in most of the body tissues is so formed.

Precursors of creatine in the body.

Assuming that creatine is formed by muscle several investigators have looked for increases in muscle-creatine following injection or perfusion by supposed precursors. No definite results have been obtained. Feeding experiments with such supposed precursors have had somewhat greater success; there is evidence that arginine and cystine may be transformed into creatine, since after feeding these to pigs and pups respectively, creatinuria is increased. There is some similar evidence that glycocyamine may be a precursor, while Paton and his co-workers (2) have adduced certain evidence linking creatine with guanidine, whence his suggestion that creatine is partly formed from guanidine as a detoxication product.

The site and mode of formation of creatine and creatinine will be discussed later.

Creatinuria in abnormal and pathological conditions.

Inanition in man and other mammals results within two or three days (after stored glycogen is exhausted) in decreased creatinine excretion, with excretion of a corresponding amount of creatine, the total creatine plus creatinine remaining about the same. This creatinuria is abolished by feeding carbohydrate or anything which will yield glucose in the body (high protein diet, glycerol) but occurs on a diet low in protein and deficient in carbohydrate. The same type of creatinuria occurs in the various forms of true and experimental diabetes; in these cases high protein diet does not abolish it since available glucose cannot be formed. Creatinuria cannot be related to absence of protein from the diet, nor is acidosis responsible. *Inanition creatinuria is therefore due to some abnormality in carbohydrate metabolism affecting the dehydration of creatine, so that it is incompletely transformed into creatinine.* The creatine content of muscle does not change during inanition until marked tissue catabolism ensues.

Febrile conditions produce creatinuria associated with increased creatinine excretion.

The creatinuria in children has been ascribed to immaturity in muscle (3). The case of muscular infantilism referred to above presents characteristic features resembling the condition in children. Here also there appears to be deficiency in creatinine excretion compensated by creatine.

Creatinuria, accompanied by diminished creatinine excretion, occurs in progressive muscular dystrophy, anterior poliomyelitis, amyotonia congenita (increase above normal for children), and amyotrophic lateral sclerosis, diseases in which muscle wasting occurs. It has also been observed in progressive muscular atrophy, but does not occur in myasthenia gravis (no definite change in muscle or nerve). It occurs in Graves' disease, and similarly after thyroid or thyroxin administration. (In our observations on R. W. T. under thyroid treatment, we noted initially a slight increase in the degree of creatinuria, but after some time a distinct diminution).

After amputation, if the remaining musculature is well developed creatinine excretion is increased, and creatinuria occurs (4).

It occurs in various liver conditions: carcinoma, alcoholic cirrhosis, catarrhal jaundice, cancer, phosphorus poisoning. Malignant disease of the liver is said to lower the creatine content of muscle. Malignant growths contain only traces of creatine.

Normal conditions have been recently reported in the Charcot-Hoffman form of muscular atrophy, in post-diphtheritic polyneuritis and in pernicious anæmia. After apoplexy, creatinine excretion is increased and subsequently creatine appears. In scarlet fever creatinuria appears on the second day, in typhoid fever only on the ninth day. It may occur in diphtheria in absence of fever (5).

Most of the fresh cases reported in this paper add confirmation to results previously recorded. The absence of creatinuria in the case of tuberculous knee-joint, No. 15, was due apparently to the cessation of the atrophy, (though the chemical test revealed the change before actual observation had done so). The case of congenital diplegia and those of congenital spinal spastic paraplegia, associated with increased muscle tonus without wasting, are in a separate category.

The recent amputations all show definite creatinuria, even on a meat-free diet. In cases 21-25, after collection of a 24-hour sample of urine on normal diet, the patients were placed on a meat-free diet for 48 hours, and the urine of the second half of this period examined. The change of diet appeared to be accompanied in some cases by increased diuresis, which may account for part of the creatinuria found (since increased water-drinking, with its accompanied diuresis, leads to creatinuria). Further examination of two of these cases on a 72-hour meat-free period, in which the second and third 24-hour samples were examined, still showed definite creatinuria in the 7-month's case, and apparently a tendency to creatinuria in the 3-year case. Case No. 26 was not a hospital patient; it was difficult to get a satisfactorily controlled sample from him. A 48-hour sample was obtained, of which the approximate total only was known. During this period one meat meal a day was eaten; the creatinuria was distinct. The figures for this case are halved to show 24-hour excretion.

If the large number of conditions are considered in which creatinuria normally occurs, and with these are further taken into account the great variety of pathological conditions in which it is also found, it is evident that *the presence of creatine in urine even on a meat-free diet cannot be regarded as of any great diagnostic importance.* On the other hand, in certain cases such as muscular infantilism, and where muscle wasting is present, the variation in the amounts of creatine excreted under comparable conditions may be utilized as a control in treatment.

Lauritzen has recently suggested that the appearance of creatinuria can be used as indicative of the pre-comatose stage in diabetes, since it is controlled by the same dietetic treatment, and is produced earlier than marked acidosis (6).

Creatine and Creatinine Metabolism.

The creatinine found in urine on a meat-free diet is derived from creatine by loss of a molecule of water; the dehydration takes place mainly in muscle as the following evidence shows: Inanition results show the metabolic connection between the two compounds. High protein feeding causes little increase in creatinine excretion, indicating that it comes chiefly from endogenous sources (the constancy of the creatinine-cœfficient in any one normal individual on meat-free diets led Shaffer to suggest that it can be regarded as an index of muscular development). Muscle-creatine varies from species to species; those with muscles richest in creatine show greatest creatinine excretion. Muscle contains not only more creatine than any other tissue, but also more creatinine. The amount of this, though only between one and two per cent. of the creatine present, is still greater than the creatinine content of blood. Incubation of muscle under buffer-reaction conditions, results in a distinct increase in creatinine content.

There is no definite evidence that creatine is broken down to any other substance than creatinine in the body, nor that it is an anabolite. It cannot be related to urea. *There is as intimate a relationship between muscle carbohydrate metabolism and creatine dehydration as that existing between the catabolism of fats and of glucose.* Apparently creatine-dehydration is required in mammals to bring about some part of carbohydrate metabolism in muscle. The change seems unnecessary merely to facilitate creatine excretion, since that can proceed directly without producing ill-effect, and the solubility of creatine is sufficiently great to permit all the creatine plus creatinine normally excreted to be excreted as creatine.

It is usual to regard creatine as formed in muscle (2). We cannot accept this view. It may be assumed that it is formed at a definite rate in some tissue, such a rate that, with the average musculature of adult man, the creatine is removed by muscle from the circulating blood (if not formed in muscle) and transformed so that the creatinine output is in that constant ratio to body-weight parallel to total musculature that is expressed by Folin's cœfficient. In women, with relatively less developed musculature, the muscle mass is only just sufficient and occasionally insufficient to handle the whole of the creatine supply. Part is then excreted unchanged. The stored creatine of muscle may only indicate a certain degree of saturation necessary to produce the effect of a mass action, creatinuria occurring when the supply required for this is exceeded. In children the muscle-mass is also relatively less, there is a constant or almost constant excess of creatine and this is excreted.

Our study of creatine metabolism in R. W. T. furnishes strong evidence that *muscle cannot be regarded as the site of formation of creatine.* His creatinine output is low, corresponding to his musculature, but the total creatine plus creatinine output on a meat-free diet corresponds approximately to the normal creatinine output for a man of his build of correct muscular development. Muscle producing the normal amount of creatine can scarcely fail to convert it correctly into creatinine. Some other body-tissue produces the creatine. R. W. T. is apparently normal, except for muscular development; creatine can therefore be produced at normal rate. The deficient muscle cannot handle it all; part is excreted. If creatine were formed by muscle, muscle degeneration might lead to increased creatine excretion through unloading of stored creatine. *Muscle-absence cannot do this.* R. W. T. shows absence, not wasting of muscle.

The theory that creatine is formed elsewhere than in muscle agrees with most of the known facts. Creatine content of muscle steadily increases from traces in the fœtus to nearly the maximum figure early in extrauterine life (rabbits, chicken, children); there is thus a gradual saturation during development, (probably from without). Adult muscle is almost, but not completely saturated with creatine. This relative degree of saturation is sufficient to explain the failures to observe change after injection or perfusion with supposed precursors. If they give rise to creatine, the supply will be in excess and excreted.

The form in which creatine exists in muscle is unknown. It is usually considered to be in very loose combination, since it can easily be extracted with water, while hydrolysis of the extracted muscle yields no more. It cannot be simply in solution, since then the relative amounts of creatine and creatinine removed by the blood would be determined by their relative solubilities (about 1:7) and the proportions present (50:1). Blood plasma and urine would then contain far more creatine than creatinine.

There is no definite evidence against the view that creatine can be removed from blood by muscle and stored. It necessitates a constant supply in blood-plasma, and a limit below which creatinuria does not occur. Such appears to exist.

Inanition results agree with the theory. Improper carbohydrate metabolism prevents normal utilization, the excess is excreted, but the muscle remains saturated. After nerve-section the creatine content of the affected muscle remains constant until degeneration commences (7). The muscle has ceased to function but remains saturated.

Muscle degeneration results in less total muscle to cope with the creatine supply, less creatinine formation, diminished creatinine excretion, and excretion of the unused creatine of the normal supply, plus that set free in the degeneration. With slow wastage the total output will not be markedly increased. With such rapid changes as occur in uterine involution it is markedly increased.

Amputation lessens the total musculature; the remaining part cannot handle all the creatine. Creatinuria should tend to diminish as the local shrinkage ceases, *i. e.* in three to four months, but except with men of exceptionally good musculature there may be permanent slight creatinuria if much muscle is removed. While our series of cases is not large, the results are in general agreement. Attempts to calculate the probable creatinine output from the body-weight indicate after recent amputation a creatine plus creatinine output larger than normal, and there is no doubt about the creatinuria. After longer intervals creatinuria either exists permanently or there is a greater tendency to it.

Summing up, it can be said that *whenever the muscle mass is less, or through any cause becomes less than normal, the tendency to creatinuria is increased.*

We have at present no evidence to offer as to the site of formation of creatine. As regards the condition after apoplexy and in those cases (Nos. 9, 18, 19, 20) in which increased tonus without definite muscle wasting is accompanied by marked creatinuria, it may be remarked that increased muscle tonus has been shown to lead to increased creatinine excretion, as contrasted with increased muscular activity, which is without effect. It may be perhaps suggested that with increased muscle tonus since the full activity of the muscles is below normal, there is decreased carbohydrate metabolism in these muscles, involving decreased creatine dehydration, and consequently creatinuria results.

SUMMARY

Consideration of the literature and of the fresh cases recorded lead to the following conclusions:

The occurrence of creatinuria is of little value for diagnostic purposes, but changes in the degree of creatinuria are of some value in controlling prognosis and treatment in certain diseases.

Creatine is converted into creatinine in muscular tissue, this process being necessary to facilitate some carbohydrate change in muscle.

Creatine is not formed in muscle.

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Review of the Clinical Significance of the Wassermann Reaction.—The great desire of the medical profession for certain, definite, quick diagnostic procedures ALBERT STRICKLER, Philadelphia, says has caused many to rely on the Wassermann test as a means of diagnosing syphilis, almost, if not altogether, to the exclusion of clinical evidence. As a matter of fact, the Wassermann test should be considered as a symptom and should be impartially weighed along with the other clinical evidence in making the diagnosis. The profession should not attempt to diagnose syphilis on the strength of a single, weak positive reaction. In Strickler's opinion the following should constitute the status of the clinical value of the Wassermann reaction as a diagnostic measure. (1) A negative Wassermann test is the presence of definite syphilitic lesions is a possibility in certain stages of the disease. This may occur at times in tertiary syphilis, inherited syphilis and also in certain types of neurosyphilis. (2) A positive Wassermann test in the presence of nonsyphilitic disease should not always mean syphilis. It should, however, arouse our suspicion to study our patient from every possible angle in our endeavor to explain this positive reaction. It should be borne in mind that a syphilitic patient is subject to any and all ailments that a nonsyphilitic patient is heir to. (3) While a strongly positive Wassermann reaction in a subject who is not suffering from any illness should cause us to investigate, nevertheless, too great stress is not to be put on it, unless this finding is confirmed by a number of reliable laboratories—Jour. A. M. A., April 1, 1922.

INTRAVENOUS INJECTION OF A NEW MERCURIAL IN TREATMENT OF SYPHILIS

W. T. Williams, M.D., C.M., L.R.C.P. & S. (*Edinburgh*)

Associate Special Treatment Clinic

Toronto General Hospital

Toronto

RECOGNITION that mercury is an essential adjunct in the treatment of syphilis is, I think, conceded by most authorities. In fact, I am not sure but that it is the essential drug and all others merely accessories. It appears to be true that accessible spirochetes are quickly overcome by the arseno-benzol compounds given intravenously and lesions disappear in a remarkably short time. Nevertheless one never feels sure of overcoming every spirochete in the body without a following or alternating course of mercury. This has been proven time and again by noting a return of the blood to a positive Wassermann, after having become negative, following doses of from one to ten or more of an arseno-benzol compound.

Granted that mercury is indispensable in the treatment of syphilis, the form of such medication is important. Many of the methods at present in use are unpleasant and some of them barbarous. The intramuscular injections of grey oil, mercury salicylate, calomel cream, etc., frequently cause such pain and inconvenience to the patient that they have to be abandoned, while inunctions are disagreeable, particularly in the warm weather.

During the past two years the writer has been using extensively an intravenous preparation of mercury, called "Mercurosal," during which time a large number of patients have been treated with it. Mercurosal is said to be a synthetic compound derived from mercuric acetate and salicyl-acetic acid and to contain about 44% of metallic mercury by weight. It is put up in the form of powder in sealed tubes, each containing 0.1 gramme and 0.05 gramme Mercurosal. It is very easily soluble in water and the writer's method has been to dissolve 0.1 gramm in 5c.c. distilled water (sterile) and inject intravenously twice or three times weekly, depending on the toleration of the patient, from ten to twenty injections as a course. It has been found possible to salivate a patient on one injection repeated weekly over a certain period, but most patients tolerate more frequent dosage.

The advantage of the intravenous over the intramuscular form of treatment is that it is painless, does not leave any disagreeable after effects, absolute accuracy of dosage, and can be continued until your patient is sufficiently saturated. Everyone knows how frequently intramuscular injections have to be abandoned on account of pain, and, if not properly given, by abscess formations and occasionally by such accidents as broken needles caused by the patient suddenly contracting his muscles at the same moment as the injection is given. One case I recall was that of a fairly stout man who was receiving an injection in the gluteal region. He contracted his muscles suddenly at the same instant that the needle thrust was made and fully two inches of the needle was buried in his buttock. The operation required to remove the broken needle caused this unfortunate patient a two weeks lay-up in hospital. Another disadvantage of the intramuscular method is that absolute accuracy of dosage is impossible unless ampules are used. With Mercurosal given intravenously one can be sure of the dosage and also keep an accurate check on the patient. All mouth preparations are uncertain and is left in the patient's hands entirely whether he takes the proper dosage or whether he takes it at all regularly.

A few cases illustrative of the use of Mercurosal, taken from the writer's records, may be of interest.

1.—A. B. Tertiary lues. Wassermann strongly positive. Had four intravenous injections of Diarsenol followed by twenty-one intravenous injections of Mercurosal. Result,—symptoms clear. Wasserman negative.

2.—Mrs. G. Secondary lues. Pregnant. Wassermann strongly positive. Had ten injections of Diarsenol followed by twenty injections Mercurosal intravenously.. Result, negative Wassermann. Baby born six weeks after last injection with negative Wassermann.

3.—Mr. G. Secondary lues. Wasserman strongly positive. Was given eight injections of Diarsenol followed by fifteen injections of Mercurosal intravenously. Result. Wassermann negative.

4.—Mrs. C. Tertiary lues. Wasserman very strongly positive. Given ten injections Sod. Diarsenol followed by thirty injections of Mercurosal intravenously. Result, symptoms all clear but Wassermann still positive.

The foregoing results may not be taken as evidences of cure, as all syphilologists are aware that one or more negative Wassermann tests are inconclusive. The cases may be merely in a state of latency, caused possibly by the spirochetes becoming arsenic or mercury tolerant. These may eventually develop into active spirochetes and the patient show a positive Wassermann with recurring symptoms. But the form of mercury given has been shown to be quite as effective as any other form of mercury and with the decided advantages as previously mentioned.

THE PLACE OF DRUGS IN MEDICAL TREATMENT*

D. S. Lewis, M.D.

Therapeutic nihilism has become such a popular pose, that one almost hesitates to present a paper dealing with drug therapy. It is not difficult to find so-called reasons for the slight esteem in which drugs are held by many practitioners. It is true that many drugs fail to live up to the claims made for them. These claims may arise from well-intentioned but faulty observations, or may result from the advertising campaign of an unscrupulous drug vendor who desires to create a demand for his products. The rise of faith healing and other cults has shown that many disturbances may be cured without drugs, and finally the great importance attached to the pathologic anatomy of disease, as Barker (1) states, has turned our "teaching hospitals into diagnostic institutes rather than institutes of therapy." In other words our teaching system is also to blame for a considerable degree of ignorance regarding the application of drugs to treatment. Certain of the objections are just and reasonable: many diseases are self limited, or are relieved by the body's own powers of resistance; others may be treated more easily by a regulation of the diet, by hygienic measures, by psychotherapy and so on, but there are many situations which can be met only by the accurate and fearless use of drugs.

It is now felt that we are on the threshold of great advances in drug therapy. As never before we are developing co-operation in our attack on the problem; the chemist is devising new combinations which will retain the favourable action of our present drugs without their objectionable features. The pharmacist is producing better preparations with more regular standards of strength, while the pharmacologist and clinician are engaged in accurate observations of the physiological action and toxicity of the newer drugs, and the effects of these drugs, not on laboratory animals, but on the actual disease process which the drug is designed to benefit. As Barker (1) says "Clinicians have wisely seen that the pharmacology of the laboratory, though of great value to the general advance of scientific therapy, cannot take the place of accurate clinical observation.... The final and crucial test of the value of any therapy is that of actual clinical experience." Rowntree (2) makes a similar statement: "In the use of drugs the general practitioner is the final court of appeal."

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*Read before the Montreal Medico-Chirurgical Society. March 17th, 1922.

Turning to the drugs actually at our disposal, how may we best apply them to the treatment of disease? There are three essentials in the successful use of any type of therapy. *First* an accurate diagnosis of the type of lesion present, and of the particular function of the body upon which the stress of the disease is falling. *Second*, a quantitative diagnosis as McCrudden calls it. How seriously is the organ damaged or its function disturbed? This is an essential point if we are to make an estimate of the response which we are likely to obtain from our treatment. *Third*, a thorough understanding of the effects which our therapy will have on the disease process, and on the particular function which is the seat of the main disturbance. The accurate and successful use of drug therapy will therefore depend on a careful diagnosis, a knowledge of the action of drugs, and a close attention to the amount of the drug necessary to attain the desired result.

A large proportion of useful drugs may be grouped under three heads: *first*, those which act directly on the cause of the disease; *second*, those which tend to correct and restore disturbed function, and *third*, those which control symptoms.

1.—Drugs which act directly on the causes of disease. These are generally spoken of as the specific drugs. They are relatively few in number, but as science progresses their number is being increased. The best known examples are quinine with its action on the malarial plasmodium, mercury and the organic preparations of arsenic which have proved so potent in combatting the spirochete of syphilis, certain other arsenicals of the atoxyl group with their action on the trypanosome of sleeping sickness; emetin the active principle of ipecac, which has done so much to rob amœbic dysentery of its terrors; tartar emetic which has proved that bilharsiasis is no longer an incurable infection, and finally the anthelmintic drugs.

True they all act on protozoal types of infection, but they are definitely parasitotropic in most cases: that is they are more toxic for the parasite than for the host. There is hope that in the future we shall have such preparations for use against bacterial infections. At present we have one such drug, optochin, which is closely allied to quinine, and which has a definitely toxic action on the pneumococcus both in the test tube and in the body. Unfortunately it also has a great tendency to produce optic neuritis and blindness, and so cannot be used in practice. Atoxyl had similar defects, but chemists have developed new compounds which are just as toxic to the trypanosome, but without the action on the optic nerve. Is it too great a flight of the imagination to predict some such development in the case of optochin as well?

2.—Drugs which tend to restore and correct disturbed function. This group contains many of our most used drugs, the best examples being digitalis, the nitrites and adrenalin.

Digitalis is a drug of the first importance, and the history of its introduction to the profession by William Withering of Birmingham is a very tangible example of the part played by careful clinical observation in the study of the action of drugs. Mackenzie recently stated that most of the clinical pharmacology of digitalis was contained in Withering's account of the drug published in 1785. The effects of the drug, its proper dosage, and the signs of its toxic action are set forth with surprising clarity.

The pharmacologist states that digitalis stimulates the heart muscle, slows the pulse, and raises the pressure, but in actual practice one notices certain variations from the laboratory findings. Digitalis has a marked effect on the heart muscle, it causes a more forcible and complete contraction, and assists in the production of that hypertrophy which is so necessary to overcome the mechanical difficulties of incompetent valves, as well as the more serious results of a damaged myocardium. Its effects on the pulse rate vary greatly with the type of heart lesion. In auricular fibrillation it slows the pulse and heart rate to a remarkable degree by interposing a block between the auricles and ventricles; but in the regular heart Christian points out that one can have all the evidences of the favourable action of the drug without any change in the pulse rate. So also the feeling is still quite general that a high blood pressure contraindicates the use of digitalis, because, in the laboratory, digitalis causes a considerable rise in the pressure. It remained for Mackenzie, Price and others to show that it did not cause any such rise in the treatment of cardiac disease. It is now recognized that digitalis tends to bring the pressure to the most efficient level in each case. If the pressure be unnecessarily high it will fall with a return of compensation under the influence of the drug. If the pressure be too low it will often rise, but never to a dangerous extent.

One frequently hears of digitalis failing to give the expected results. Pratt states that this is nearly always due to too small dosage, or to an inactive preparation. Preparations of digitalis do show large variations in their potency, and Lewis and Moffatt have recently found that only about two-thirds of a series of preparations sold in Montreal came up to the accepted standards. If one fails to get results with digitalis in a suitable case it is always good policy to change the source of supply and give the drug a further trial.

Quinidin also affects the heart in a remarkable manner. In auricular fibrillation it actually re-establishes the normal rhythm of the auricles in about half the cases. Its action, however, is not without danger, and the time has not yet come for its introduction to general use in the profession.

The *nitrites* are another group of drugs exerting their action on the circulatory system. The effects of a tablet of nitro-glycerine dissolved under the tongue during an attack of angina pectoris are too striking to be easily forgotten. This mode of administration is a convenient and efficient one, and does away with the added emotional strain of having to inhale amyl nitrite in public. The nitrites may be used also for the prevention of anginal attacks. Following the use of nitro-glycerine the patient is frequently able to go through exertion which would precipitate an attack if he were not protected by the drug.

Adrenaline. The relief which follows the hypodermic injection of adrenaline chloride in bronchial asthma is one of the most dramatic examples of drug efficiency. Almost immediately following the use of from five to eight minims of the solution (1:1,000), there is a relaxation of the bronchial spasm and the patient is made practically free of symptoms. Cases which previously required from one quarter to half a grain of morphine for a tardy relief may now be made comfortable in a comparatively few seconds. True, the relief is only of a temporary character, but it enables us to control the seizures while a search is being made for the causative agent by means of the skin tests. Even if we are unsuccessful in this quest, we still have the drug to fall back upon, as the effects are often preserved over long periods of time.

Adrenaline may also be used to control the urticarial eruptions which occasionally follow the use of foods to which a patient has an idiosyncracy. In these cases a single injection is often followed by prompt relief.

The effects of these drugs and of many others which might be referred to, are so striking that every physician must admit that drugs have a definite place in our therapeutic armamentarium.

3.—Drugs which affect symptoms. Finally the use of drugs to combat symptoms is perhaps one of the most unsatisfactory from the scientific aspect, but still a necessary one from the practical view point of the relation of the physician and patient. Naturally the patient looks to medical treatment for one of two results: a cure of his complaint, or a palliation of his suffering. In most cases these symptomatic drugs should be employed merely to carry the patient along until surgical or medical treatment can be directed towards a removal of the cause. Morphine and opium have a definite place in the relief of renal and of biliary colic, but surgical treatment is the rational mode of cure. Macht's work on the opium alkaloids has shown that certain of the less used members of the series have a greater effect in spasm of smooth muscle, than has morphine, and it is possible that in certain cases of ureteral calculus, and in the passage of small plugs through the biliary tract, papaverine may eventually supplant the more frequently used morphine. This possibility receives support also from the well known fact that pantopon, a mixture of all the opium alkaloids, is more efficient in the relief of these seizures than is a corresponding dose of morphine used alone.

Codein in the dry cough of tracheitis and laryngitis is almost a specific drug. Here we have a vicious circle; the inflammation of the respiratory mucous membrane causes the cough and the cough aggravates the inflammation. If given in sufficient doses to depress the respiratory centre and stop the cough, codein breaks up this vicious circle, and allows of a natural healing of an undisturbed tissue.

The analgesics also have their use in the relief of headache and the lesser pains of peripheral neuritis, but they should be used as temporary measures. We should make every effort to identify and treat the cause of the disorder. It is an obvious prostitution of drug therapy to treat a sciatica of diabetic origin by the use of drugs alone. Dietary regulation will usually control the pain, and will tend to improve the patient's general condition. So also the headaches arising from errors of refraction, from chronic sinusitis, or from the more serious causes, brain tumour, abscess, or syphilis, should be treated through their several causes, and not symptomatically.

In conclusion, if we keep in mind that the secret of successful treatment lies first in an accurate diagnosis of the nature and severity of the disease process, and secondly in a wise application of therapeutic measures to meet the conditions which are present, we shall be well on the road toward the proper goal of medical treatment. We will adopt not an attitude of nihilism but rather one of confidence in the drugs which we employ. We may not employ a multitude of these remedies, but we will have a goodly number of trusted aids, which will rarely forsake us in our fight against disease and suffering.

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CAESARIAN SECTION*

A. Mackinnon M.D., F.A.C.S.

Guelph

In the 80's of the last century when Sanger introduced the stitching of the uterine wound it may be said that Caesarian section began to find a place in surgery. About the same time in Great Britain, Murdock Cameron published several successful cases. But, at that time, the only indication for which it was performed was contracted pelvis. In 1898 the resourceful mind of the great Tait urged its performance as the proper method of dealing with Placenta Praevia.

Early in this century severe eclampsia was considered another indication. At the present time the indications for Caesarian Section, besides those above-named, embrace the following other conditions, namely, tumours, impacted shoulder presentation, abnormal conditions of the child, undue rigidity of the cervix and vagina, grave diseases threatening the life of the mother and some cases of prolapse of the cord. My own experience in Caesarian section is limited to eclampsia, placenta praevia and failure of the head to engage in the pelvis in a primipara.

Eclampsia:

I will briefly relate four cases and follow with some observations.

(1) In 1910, Mrs. H., primipara—Since early in fifth month she showed albuminuria and oedema. The usual treatment including saline purgation, rest in bed and milk diet failed to benefit her and by the end of the eighth month her condition had become critical. Enormous oedema, the urine scanty and loaded with albumen. In October, 1910, in the Guelph General Hospital and about three weeks before term Caesarian section was successfully performed. Mother and child lived. Patient left the Hospital on the seventeenth day. Urine abundant and free from albumen.

(2) In 1913, Mrs. R., primipara—Admitted to St. Joseph's Hospital in the eighth month. Albuminuria since the fifth month and great oedema. Convulsion about three weeks before term. Caesarian section was performed. Mother and child both survived, leaving the Hospital in good condition in the third week.

(3) In 1913, Mrs. R., primipara—Very little oedema but albumen present. Convulsions about end of eighth month. Caesarian section—child lived, mother died on 3rd day from Septic Peritonitis, caused by a pus tube.

(4) Mrs. Y., primipara—Admitted to St. Joseph's Hospital Sept. 1st, 1920. Albumen from fifth month, considerable oedema. Next day, convulsions occurred. Four before operation and four after. Caesarian section—Mother and child recovered. The albumen slowly disappeared but the Sp. Gr. never rose above 1014, generally 1010 or below. This woman was delivered on January 11th, 1922, of her second child. Chloroform and forceps required as the labour was difficult. No trouble arose from the previous Caesarian Section.

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*Read at the December Meeting of the Guelph Medical Association.

Placenta Praevia—*Two Cases*

(1) In November, 1919—Mrs. McL., age 37, Guelph General Hospital. One boy, age nine. Had several sudden attacks of haemorrhage, the last severe, about the end of the eighth month. Caesarian section. Both mother and child recovered. In this case the mother was able to nurse the child.

(2) Mrs. H.—Fourth Pregnancy—(March 21st) St. Joseph's Hospital. A low lateral implantation recognized. Several haemorrhages. Caesarian section. Both mother and child recovered. The child about seven months. After the removal of the placenta a large fibroid polypus was found attached by a pedicle, about an inch in diameter, to the lateral aspect of the uterus. This was excised and the pedicle ligated. The presence of this large tumour in the uterus led to the belief that the term of pregnancy was more advanced than was found.

In a primipara, and in all patients with a small pelvis, and in every case if the haemorrhage is severe, I have no doubt that resort to Caesarian section is the safest method of procedure in placenta praevia. In a multipara with a roomy pelvis and the os soft and dilatable, the membranes may be ruptured, through the placenta if necessary, and turning may meet the condition and save both mother and child without section.

In some 12 cases of placenta praevia, of which I kept records, treated many years ago, I think all the mothers but one survived; of the children all died but one. The methods as then practised were carefully followed. Plugging and often re-plugging the vagina, and turning when possible in multipara, but labour was concluded by some method as soon as possible. What anxious hours for the Doctor and the friends!

Contrast: The condition of the patient who undergoes Caesarian section. Patient is prepared in Hospital. In 35 or 40 minutes she is back in bed. Mother and child practically out of danger and a strong probability that the mother will be able to nurse her child. In the old way generally one life, rarely the two, was saved after a desperate fight, lasting sometimes a day or two. By Caesarian section, after mature consideration, prompt decision and immediate action, all anxiety is practically removed in one hour.

As to Eclampsia—Four cases are here reported and one death which was not due to the Eclampsia or the operation but to a pus tube, no doubt disturbed by the operation as it would probably have been by the occurrence of labour. All the children recovered though three of the number were premature, one being a seven months child. Looking over my old reports of cases of puerperal convulsions I find a report of 17 cases. Four mothers died from uraemia and all the children except where the convulsions occurred post partum. Many were premature and so toxic from the mother's condition that they were stillborn, or died a few hours after birth.

To some of these 17 cases I was first called when the convulsions had already set in. In those cases I resorted to early venesection and the use of Morphia, Chloral, Bromide or Chloroform as might seem indicated. When the patient was conscious I always had the bowels acted upon promptly by Calomel, Salts, and once by Croton oil.

When under my own care from the fifth or sixth month, with albumen present, and more or less oedema, the usual measures, such as rest in bed, warmth, saline purgation and milk diet were carried out carefully. In many such cases they went to full term without convulsions. Others went on to the seventh or eighth month, so that if it became necessary to terminate the pregnancy the child was viable.

It remains to relate a case submitted to Caesarian section because the head failed to engage properly in the pelvis. Mrs. B., primipara. In October 1913—My son, the late Dr. Kenneth, was called. He found sufficient dilatation, and under anasthesia and with antiseptic care he was able to get the forceps properly applied. After failure, by use of reasonable force, to advance the head, I was asked to assist him. The friends were advised that possibly forceps delivery might succeed but that it involved great danger to the child and possibly severe injuries to the mother. She was removed to St. Joseph's Hospital and the operation of Caesarian Section was accepted by her and her friends as involving less danger. Mother and child left the Hospital in excellent condition on the sixteenth day after operation. Let me add that it was my privilege to attend this woman two years later with her second child which was delivered naturally and without instruments and that she made an excellent recovery—thus showing that the uterine wound in her case had healed so firmly as to give the uterine wall its full normal strength. If we could feel sure of such a result in every case, in this day of excellent hospital advantages, how very many cases would we submit to Caesarian section, rather than deliver by the vagina with severe injuries to the mother and the probable death of the child. In my own experience I can recall many difficult instrumental labours. Too often in these bad cases the child, if not still born, died within a few hours or days after birth and the mother was so injured as to require considerable repair to make life tolerable.

Can we close that uterine incision so perfectly that the wall will regain its normal strength? If we can, we may extend the use of Caesarian section immensely.

In all my cases I have been extremely careful to procure exact co-aptation of the edges of the incision and I use 5 Chromic cat-gut No. 2, stitches in every 2 inches. I use a rounded curved needle which enters $\frac{1}{4}$ inch from margin of incision and takes a large bite emerging at the mucous layer. On the opposite side, re-entering at the mucous membrane and going into the uterine wall so as to include a large mass it emerges $\frac{1}{4}$ inch external to the other margin. I have seen a suggestion to lift the peritoneal covering of the uterus a distance of $\frac{1}{2}$ inch on each side of the whole length of the incision. In my judgment it is a useful hint and will make a perfect closure of the incision much easier. This will greatly aid in preventing the possibility of intestinal or parietal adhesion to the incision.

At the last meeting of the British Medical Association, two excellent papers on this subject were presented; one by Dr. Munro Kerr, Prof. of Obstetrics and Gynecology, Glasgow University, on the indications for Caesarian section and another by Dr. Eardly Holland of the London Hospital on the methods and technique of Caesarian section. These papers were followed by a discussion in which a large number of the most able obstetricians in the British Empire took part.

TECHNIQUE

Suture—Material. Dr. Holland advised silk worm gut as the best, silk next best and he considers cat-gut as most unsuitable. I have used Chromic cat-gut No. 2 in all my operations, but I recognize that the few cases I have had do not entitle me to speak with any authority. I may intimate that nearly all British Surgeons are not in favour of the use of cat-gut, especially in abdominal work. Possibly the cat-gut in the damp climate of Great Britain does not keep so well. I can see that the use of silk worm gut or silk, being practically unabsorbable, might lead to trouble. In one case some years ago I had to remove a buried silk worm gut suture several years after operation. The sutures should be interrupted, 5 in 2 inches, that is not more than 2-5 of an inch apart. The best needle in my judgment is a fairly large curved needle with a round point. It should be so used as to take a large bite of the muscular wall on each side of the incision. There should be no hurry as it is essential for the future welfare of the patient that the co-aptation should be as accurate as possible. Then the suggestion made by Dr. Holland that the whole line of incision should be completely covered by the peritoneum is worth keeping in mind.

Dr. Holland collected records of about 4,000 cases of recent Caesarian section; of this total 3,374 were performed for pelvic contraction.

The maternal mortality of 1,953 he classified thus:

	No. Cases	Deaths	Percentage
Not in labour	1202	19	1.6
Early in labour	389	7	1.8
Later in labour	224	24	10.3
After induction of labour	35	5	14.0
After attempts at forceps delivery	103	28	27.0

Cause of death in 124 cases was given as follows:

Peritonitis	50
Septicaemia	27
Pneumonia	15
Embolism	9
Haemorrhage	8
Intestinal Obstruction	5
Cardiac Failure	9
Ileus	1

In the discussion in the British Medical Association to which I referred, the necessity of great attention to the perfect closure of the incision was emphasized. So many of the cases are quite young, generally first labours with pregnancy liable to follow soon again, that several advocated sterilizing the mother at the time of operation to avoid the danger of sudden rupture of the uterus in a subsequent labour as has happened in about 4 per cent. of cases earlier reported. The uterus about to undergo subinvolution and contracting intermittently for several days, from the recurring after-pain, is certainly far from being in an ideal condition for the primary healing of the incision. However regrettable, it would be wiser to sterilize the mother, than that she should lose her life from shock and haemorrhage if rupture should occur from an imperfectly healed incision. With great care in closing the incision I have good hope that such danger can be avoided. Until I see a stronger reason I will not sterilize any mother on whom I may operate.

It will be seen in the Table above given that the mortality in cases after attempts at forceps delivery was very high: 27 per cent. In one of the cases here reported attempts at forceps delivery were made by my son and myself—and afterward the patient was removed to the hospital. Her recovery could not have been easier or more absolutely normal. I feel, therefore, that even if efforts at forceps delivery have been made, if these attempts were made with reasonable antiseptic care and good judgment, we have the right to expect a successful result by Caesarian section.

Since this paper was written I attended another of these cases. The labour commenced at full term and the membranes ruptured spontaneously almost at the beginning.

In fourteen hours there was full dilatation and the head engaged in the pelvis. Chloroform was used and assistance by the forceps given to deliver the head. In this patient it seemed clear that the uterus had regained its full normal strength. The pains were very strong, regular and quite effective. She made a good recovery from her labour.

THE X-RAY EXAMINATION*

H. M. Tovell, M.B.

Toronto,

In order to comprehend the subject it is well to recall that the x-ray examination depends on definite changes brought about by the invasion of the lung substance through the entrance of the tubercle bacillus, causing a reaction by a round cell invasion at the site of lesion, followed in favourable cases by the formation of fibrous tissue and calcification or, in unfavourable, by consolidation, cavitation, etc. The ray may be considered as a light wave which travels in straight lines, and, according to the resistance of objects encountered will penetrate in varying degrees. Therefore, in accordance with the underlying pathological changes, the plate will always show these differences of penetration; in the form of slight flocculent shadows from cellular change, in dense shadow from consolidation and calcification, and where lung substance is destroyed and therefore no resistance is encountered, by increased translucency. One great difficulty arises in distinguishing between the changes wrought by round cell invasion and those by early fibrosis. This latter point is crucial as herein lies the impossibility of distinguishing between activity and healing. The later shadows cast by the production of firm fibrous bands and calcification generally offer no great difficulty as their shadows are quite definite and can readily be differentiated. The x-ray examination, therefore, fundamentally differs from the auscultatory as the latter depends upon sound waves which follow the lines of least resistance and will travel through a tube no matter how tortuous. Hence the slight changes brought about by cellular invasion, while probably being present, are dispersed through lung tissue sufficiently to make them inaudible at the chest wall. This differentiation from the standpoint of physics undoubtedly explains a great many discrepancies between the x-ray and the physical examination.

Remembering then that the changes, as shown upon the plate, are based upon a physical basis, we have another means of studying the pathology of pulmonary tuberculosis. We have the opportunity of observing a given case from the time of presentation through all its varying phases. This opportunity, if developed by serial plates over a period of months, would undoubtedly unveil a mine of valuable information and so fill the gap between the early clinical case and the post mortem. That the changes shown upon the plate can be relied upon has been abundantly proven by the anatomical studies of Miller, Dunham and others, and the post mortem studies of Ghön and Opie, the two latter working in different countries arriving at conclusions which verify the radiographic aspect of tuberculosis. At the present time it is generally agreed that we are able to distinguish three radiographic types of pulmonary tuberculosis.

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*Being part of a Symposium on the Diagnosis of Pulmonary Tuberculosis. Other papers will appear in next issue.

Hilum Tuberculosis is usually found in children under eleven, associated with a definite chain of symptoms indicative of a tuberculous invasion (cough, rapid pulse, slight evening temperature, child is less active, tires easily, physical signs may or not be present, tuberculin test is positive). In this class the roentgenogram will show an increase of shadow more or less woolly round the *hila*. Later this invasion will be overcome, followed by healing and so presenting the very common picture of marked calcification so often met with in adult work. Although nothing distinctive may be present before calcification, yet if one carefully examines the plates, one can always find a definite localized peri-bronchial thickening and branching, extending from the lung substance to the *hilum*. The *hilum* changes are however, the more prominent. This is in agreement with the excellent work of Ghon who found that, although the primary pulmonary lesion may be slight, yet the more marked reaction will be at the *hilum*. The radiograph has its value in these cases by showing the prominent *hila* changes. The differential diagnosis is made by the clinician who by the aid of the plate is able to see the seat and extent of the lesion.

Peribronchial Infiltration. This type is usually localized to the upper regions and is characterized by fine peribronchial markings, fan-shaped, extending from the peripherial portion to the *hilum*, and studded by round, more or less small whitish nodules. *Hila* shadow changes in varying degrees are always present. While this type usually shows a more or less disposition towards local prominence it may be general. Peribronchial tubercle is not likely to give physical signs unless generalized. The x-ray in this class is of extreme importance as otherwise there is no way of determining the extent or location of the disease which, if undiscovered, would undoubtedly lead to extensive involvement before detection.

Parenchymatous Infiltration. This class is often spoken of as being typical of tuberculosis. It is characterized by the presence of small whitish, more or less discrete shadows, localized over small or wide areas, appearing in the upper chest, in the region of the bronchioles. Peribronchial markings are usually seen connecting these shadows with the *hilum*.

Cases undoubtedly occur which follow one or other of these forms. Many, probably the majority, show evidence of all, with one type predominating. While one cannot enter upon the theoretical points on which one bases the opinion that pulmonary tuberculosis is present, in general it may be stated that it depends upon our knowledge of the pathology of pulmonary tuberculosis and, therefore, the grouping and location of these shadows, especially when localized or pronounced in the upper chest and if associated with such conditions as cavitation, fibrosis and calcification, etc. it makes a diagnosis fairly certain.

Cavitation. Cavities are more or less annular and are always accompanied by lung destruction surrounded by a zone of infiltration which is shown on the plate by a shadow of varying density enclosing a space in which lung markings are absent, differing materially from localized pneumothoraces, as described by Brown, which while annular in shape, enclose an area containing lung markings, and when studied over a period of time, may entirely disappear. Often on one examination the two types are extremely hard to differentiate, but if kept under observation the difference can usually be demonstrated. A true cavity can always be detected unless obscured by some overlying shadow, such as that cast by fluid etc.

Fibrosis. The formation of fibrotic tissue in an area which as a result of either chemical or physical means has undergone destruction is the normal response towards repair. It would, therefore, be very difficult unless other evidence of tuberculosis be present to distinguish between a fibrosis due to the invasion of the bacillus tuberculosis or other microbic organisms. That this is true has been demonstrated by many observers. It has been noted in cases of dust inhalation by Pancoast who found in borderline cases apical changes quite similar to tuberculosis. Again cases of pneumoconiosis are liable to be complicated by an engrafted tuberculosis which renders the picture much more difficult if not impossible to distinguish. A more recent pulmonary condition has been noted in chests of soldiers who were subjected to gas inhalation. This results in destruction of the epithelium lining the bronchi and finer branches, although it may be too early to speak with certainty it is worthy of note that in this class; changes which resemble a peribronchial tuberculosis have been observed, the difference being that the changes due to gas are more general and bilateral and do not show the same amount of studding. The *hila* and lower lobes usually show a marked amount of shadow but borderline cases do occur and these are extremely difficult to differentiate. It would therefore seem fair to conclude that when fibrosis is present a thorough history of the case is essential before an opinion should be asked or given. The value of the radiograph lies chiefly in the fact that it localizes and gives an idea of the total amount of fibrosis.

Activity. It is a debatable point as to whether activity or inactivity can be shown upon the plate. We are of the opinion that it cannot. Chronicity on the other hand can be fairly established by the characteristic shadows of dense fibrosis and calcification.

Comparing these types with the clinical cases we find that fever, pleurisy, and general symptoms are found in both the parenchymatous and peribronchial in equal proportions. The peribronchial type usually has few physical signs, the parenchymatous type gives many. Haemorrhage, sputum, tubercle bacilli, moist rales, etc. are found most frequently with the parenchymatous.

Classification. Important as it is to show which type of tuberculosis is present, it is probably more important to be able to state definitely the extent of the lesion. Recalling the introductory remarks, we will remember that the extent of the lesion will always be shown. This ability to classify a given case has at last become a recognized procedure. Nowadays no case should be classified from the history and physical examination alone, but only in conjunction with the radiographic, when it will usually be found that the disease is more extensive than thought from the clinical examination and further, it will be seen that tuberculosis is rarely unilateral. One side may show a predominence but both will show evidence of tuberculosis. Brown, Heise, and Sampson in a series of 814 cases showed that 48% were farther advanced than suggested by the physical examination. They, therefore, concluded "That the classification based primarily upon the extent of pulmonary disease should rest not only on the notoriously uncertain physical signs but also upon the extent of the disease as shown by the x-ray plates." To illustrate this point more fully two cases recently observed showed a slight rise of temperature on exertion, inability to perform light work without a sense of tiredness out of proportion to the energy expended, their weights were below par. The physical examination was not definite in either case yet in both the physician was confident that pulmonary tuberculosis was present. Clinically they were classified as minimal. The x-ray examination showed very slight and early peribronchial changes in one, while the other showed a marked bilateral peribronchial involvement demonstrating that the patient had long since passed the minimum stage.

That the ability to demonstrate the total involvement is important from the standpoint of prognosis and treatment is well recognized, especially so if operative procedure or penumothorax is contemplated, as the condition of the least involved lung must be known especially so as the life of the individual will depend entirely upon its ability to perform the function of respiration. It is also important to know the condition of the diseased lung in order to estimate the probable success of obtaining collapse, and after collapse has been obtained the physician has then an excellent means of studying subsequent developments and so altering his procedure as circumstances arise.

At the present time there are two distinct parts of an x-ray examination—first the fluorescent screen and second the stereoscopic plates. From the screen examination gross lesions, such as large areas of consolidation, cavity formation, mediastinal glands, displacement of organs, and movement of the diaphragm can be well demonstrated. It also affords an excellent guide as to the lung collapse in cases of pneumothorax. It should never be relied upon for finer lung detail and as the diagnosis so often depends upon the ability to demonstrate these slight changes, plates must always be taken. The use of the single or flat plate should only be mentioned to be condemned. It will give very little accurate information. While this is probably obvious to a great many, yet it is of extreme importance because at the present time too many rely upon the screen and single plate. This use has undoubtedly led to many serious errors and so casts discredit upon the examination. In early cases no opinion should be given from a screen examination but only after careful study of the stereoscopic plates. Whether or not the proper interpretation is made is another matter depending as it does upon the knowledge and skill of the roentgenologist who must be trained in the science of medicine, without which he is a mere technician and cannot give an opinion of any greater value than could be obtained from a physical examination by one untrained for such an undertaking. The full value of the examination will only be realized by the roentgenologist having a full knowledge of the history, clinical and laboratory findings. This can only be accomplished by co-operation between the radiologist and clinician, which is doubly essential in all borderline cases, as markings quite similar to tuberculosis can be obtained secondarily to upper respiratory disease or to such conditions as produced by the inhalation of dust or other foreign bodies encountered in various spheres of life, and not until this co-operation is more fully developed will the patient derive the benefit from the examination to which he is entitled. It is a common experience to have a patient referred for x-ray examination of the chest who has never been examined physically. This is wrong. In all cases the physician in charge should make a thorough examination before recommending further investigation. There is no doubt that the x-ray examination of the chest fulfills a long felt want. It does not supplant the physical examination. It complements it. There should be no discussion regarding their relative value for both have their place.

Lately there has been a tremendous increase in the number of men doing x-ray work which in itself is a favourable sign, but may we add a note of warning? X-ray interpretation requires study and before any person attempts to give an opinion he should have spent considerable time with an experienced roentgenologist of recognized ability. The mere purchasing of a transformer in no way purchases the ability to interpret the plate. In our experience one of the most difficult problems with which we are confronted is to give a well balanced opinion in cases which might or might not be early tuberculosis. We do not wish to discourage but urge those entering the field of roentgenology that if they will make it a matter of serious study much valuable knowledge will be gained.

THE NEW ORDER*

Gilbert Jackson

Toronto

THE doctrine of free competition has been summed up in the phrase, "Each for himself, and the devil take the hindmost." *All* epigrams are a little unfair, and this is not an exception to the rule. But if it does unfairly sum up the thought of Cobden and Bright and Mill and Gladstone, it also presents briefly and vividly the lasting impress of their doctrines, which the British man in the street retains today. His father may have looked on Bright as a prophet, and believed in competition for humane and social reasons. But the living Englishman of this generation reacts not toward, but away from it. He no longer believes that competition is an automatic safeguard of each man's private interest. He now holds a different social ideal, and looks elsewhere for security.

In striking contrast to the great reaction against individualism, which has been gathering force for many years, in Europe, the educated American, who for a long time was free from the trammels of social philosophy, now begins to find a good deal of comfort in these old individualist principles. Their working is to be seen in many walks of life. Anti-trust legislation has generally rested on a glorification of free competition. The great campaign speeches of Mr. Woodrow Wilson, which have been published under the name of "The New Freedom," are instinct with the notion of giving free play to the great creative energies of America, by restoring free competition. The big drive which is now being made by the most powerful heads of American business, in favour of the "open shop," undoubtedly rests, in the minds of many who support it, on grounds of selfish interest—on substituting for the shop closed to non-union labour a shop closed to members of trade unions. But besides short-sighted and selfish supporters of the movement, there are many more whose vindication of the open shop—a shop (in their minds) open alike to union and non-union workmen—rests on the purest principles of individualism. For all the difference in experience which lies between these men and the great political thinkers of the nineteenth century, their views are not so far apart.

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*An address before the Round Table of the Ontario Medical Association.

Now the contact between ourselves and the thinking public of America is very close. So long as we share the same language and literature, read the same press despatches, lead the same kind of life and meet the same kind of problems, it must be very close. I suppose our gathering here for this meeting is a recognition, in a sense, of our closeness, for I know that there are many members of the medical profession in New York State, who take a keen interest in the Ontario Medical Association. Any drift of thoughtful American opinion (such as, I believe, exists in favour of perpetuating the system of free competition on which modern industry was founded) has a very direct bearing on us and our future, whatever vocation we may follow.

One outstanding mark of a belief in free competition is its conservatism. I mean, conservatism with a little "c;" not political conservatism, which is sometimes merely radicalism in disguise, but the conservative instinct that wants to preserve existing institutions. The competitive system is our legacy from the Victorian era, which swept away so many boundaries and broke so many shackles. Its permanence would help to make permanent our present order of society. In its permanence, therefore, are interested all the large number of small property holders, who having done pretty well under the present regime, are not quite sure that they would do equally well, if some other were to take its place. "Where your heart is there will your treasure be also."

But the mere fact that large numbers of people are in favour of preserving an existing system, will not alone preserve it. Large numbers of people once supported chattel slavery—the right to wage private warfare—the guilds of the middle ages—and the stage coach—but all of these perished long ago. Most human institutions barely ripen to maturity before the conditions that produced them are profoundly modified. Almost as soon as men's minds have got used to them, they begin to be replaced. We are bound, if we have any scientific temper, to recognize that it is far less natural for human institutions to crystallise, than it is for them to change. No matter how closely our chief interests may be bound up with the present, it is well in any contemplation of the future to recognize the probability of change.

To this is not to commit one's self to definite forecasts of the future. The world is already too full of prophets. Communists, socialists, guild socialists, novelists, clergymen, biologists; the world is full of people who can foretell exactly the lines of evolution. We may conclude with a good deal of reason that all of them are likely to be wrong. For whenever great changes have come upon us in the past, they have come like a thief in the night. They have often been explained successfully, but only some time after their arrival. There was a time not long ago, when a certain type of soldier claimed after each retirement that "he made it according to plan." But if it is so that men retreat, mankind *advances* in another way. Change as a rule bewilders us exceedingly.

The more a man appreciates how complex are the forces, through whose interaction change occurs, the less is he likely to have a taste for dogmatic speculation. But if, like Balaam, he declines to prophesy, he need not refuse to think about the subject. He can at least look at some of the forces which are at work around him.

One of these, whenever it exists, is a great experience shared in common, by a generation of men and women. And since the war did, in an extraordinary manner, unite more than twenty millions of men in a common experience of military service, I would like with your permission to dwell for a few moments on our possible heritage from this experience.

Generations hence, men will still be trying to sum it up in a formula—to find the measure of experience common to young and old, combatant and non-combatant, vanquished and victor—to all who were drawn into the maelstrom of the war. A wonderful difference of temperament separated the man who liked fighting—a rare bird but one not yet extinct—from the chocolate soldier, and both from the married man, whose one ambition has been well expressed by Kipling:-

" 'E wants to *finish* 'is little bit,
"And 'e wants to get 'ome to 'is tea."

There will be many who fail to see that these had anything in common. Other observers have studied at first hand the healing genius of memory: how Nature sifts our past impressions, and often consigns the most painful of them to oblivion, causing us to remember only those whose recollection is a pleasant thing. They may be inclined to doubt whether the men of our generation will as a body carry with them any coherent memory which dominates their thought on social questions.

If the judgment here expressed is at variance with theirs, I can only say that it was not reached as the result of any process of logic, or on the basis of a definite collection of evidence. But it is the result of an honest effort to gain a general impression, from men who served in several armies and in many regiments, who sometimes formed no very clear opinions, and often could not state them clearly.

I believe that the men who came back from the War, were imbued fairly deeply with three main impressions, which will influence their thinking everywhere. In the first place, they had seen—often for the first time—the power of organized effort. They had seen with how small an expenditure of energy the daily life of a thousand men can be conducted, if each man plays his proper part. They had seen troops assembled in enormous numbers, from different places and by different routes, often without mishap, and sometimes without loss of time. They had seen how small a force of men, armed and disciplined, is required to control a large mass of unarmed and unorganized civilians. They came back with a belief in organization, which is attested by the demand of the returned soldier for education, (that is, for organized knowledge,) by the growth in numbers of the trade union movement, by the readiness of men to put themselves under discipline for purposes which they support.

In the second place—if I am not mistaken—they came back with a new dislike of interference by the state. At the best of times we have seldom treated the state as an equal. Some of us have regarded it as an elderly grandparent—some as a grandchild needing careful guidance—all of us as if it were something of a nuisance. But to the soldier it was an infernal nuisance. It had decided what he was to wear, and how he was to wear it—what he was to eat and how much—when he was to get up and when to go to bed—when he might go home and how long he might stay there. No man who has not experienced the freedom of being a civilian, after being for months or years at the call of a sergeant, can realize completely what that freedom meant. In proportion as men had grown tired of listening always for the word of command, they came back determined to live out the balance of their lives in their own way. Organization they believed in, but it was to be their own organization, and not one imposed upon them.

And in the third place, was not the outstanding lesson of the war, at least for those who took part in it, a lesson in human decency? The millions of men who served, volunteer and conscript alike, enlisted as a rule in the spirit of self-sacrifice. Individuals were selfish—individuals stole from the common store—individuals thought in terms of personal promotion, or schemed for their personal safety. But in the mass, men did nothing of the kind. In no place did a man fulfill his duty to his neighbour, so well as on active service. There he shared freely with his fellows, and if he had a care, it was to see that he got less, and not more than his due. And the greater the hardship, the shorter the rations, the harder the life, the more intent he was to live according to his rule—to "play the game."

It is for these three things, I fancy, that the best of the returned men stand. They will influence ex-soldiers everywhere, in dealing with the social problems which wait for us now war is over, "in that new world which is the old." Nor need we suppose that they will affect the soldiers only: for there were vast numbers of men and women who belonged to neither of the services, but who dedicated themselves to war work of one kind and another, in exactly the same spirit as those who were enlisted. All the lessons of team work for a common object, supreme but quite impersonal, were open to workers in munition factories; and if they were never seared into them by the keenest experience of all, they will not altogether be forgotten.

Those who retain as dominant impressions of the war the three which I have sketched, are likely to bring a spirit into public affairs which is the reverse of Prussianism. We may suppose that they will organize into groups rather readily for objects common to the group: not expecting the state to nurse their enterprise, nor willingly letting the state interfere with it. And when other groups do likewise, they will be rather less ready to look for selfish motives, rather more ready to suppose that their motives are decent and generous, than if they had never received their impressions or had lost them. There will be rather less rivalry, rather more of a spirit of partnership. We shall be more organized, and less centralized because of them.

Keen observers had already seen a movement in this direction before the war began. If there is anything in our analysis, it simply means that this movement will be strengthened. Our social fabric is honeycombed today with what are called class organizations. Every trade-union is open to this description, every manufacturers' association, every professional organization, each lodge of the united farmers. But the thing that matters most in all these bodies is not the form, but the spirit. The words "Sinn Fein," we are told, may be simply translated as "ourselves alone." If each group of persons with a common interest is to live in the spirit of those words, then we have indeed produced a dangerous series of class organizations. Their efforts will only weaken the structure of society, where they do not fail entirely through conflict with economic law. But an organized group is by no means inevitably swayed by selfishness; the medical profession is itself a group, organized loosely but organized for all that, with no selfish object before it, but only the performance of a public service.

The driving force behind these spontaneous groupings does not come always from the same direction. In broad contrast are the bodies organized by those who purchase goods or services, and the bodies organized by those who produce them for sale. To the former class belong all consumer's co-operative societies, and some producer's societies also: in the latter we find merchants' and manufacturers' associations and unions of workmen. Sometimes we come across a body which is both and neither; which exists in order to sell the produce of its members, and at the same time to buy for them the things they need. But in spite of hard cases of this kind, the distinction is fundamental and important, between group action to satisfy the wants of buyers, and group action on the part of those who sell.

Nowhere is it seen more clearly, than in the case of medicine itself. On the one hand, the whole of society depends on the work of the doctor. We are all of us consumers of his services; indeed, unlike the consumers of most things, we cannot do without him. To the world at large, the medical profession stands in the rôle of producer: for doctors are producers of wealth no less (if no more) than manufacturers and farmers. The measure of their contribution to the common wealth, is the difference between the wealth which a people could produce without the medical profession, and the very much larger production which is actually made through their success in preventing, or treating human ailments.

The public has therefore an interest as real as that of the profession, in the practice of medicine today. It has usually sense enough at least to confess its own ignorance on matters purely technical. But if it knows nothing about disease, it may presume to have opinions no certain other things. The doctor himself is not concerned more directly with what we may call the economic aspect of medicine. For it is sometimes the misfortune of a community, that the more it needs adequate medical attendance, the less chance there is of ever getting it: and it is often the misfortune of an individual, that the more medical treatment he requires and gets, the less able he finds himself to pay for it. Chance spells of sickness have sometimes crippled families, and scattered the savings of a lifetime: and in other cases (doubtless far more common) the doctor has worked in the knowledge, that the greater his service to the patient, the less his prospect of ever being fully paid for it.

Now the public has learned in the last generation, that the risk of sickness is insurable. If it did not know this before 1911, it has learned a great deal since then. And if we cannot follow the custom (said to be practised in China) by which a man pays his doctor, so long as his health is good and he can earn a living (ceasing to pay as soon as he has to call in medical attendance)—if we cannot allow that excellent custom, then a system of payment for insurance may suggest itself as a convenience. In England, for instance, the National Insurance Act was imposed on the medical profession from outside. As the doctors themselves described the situation, it came like a wolf on the fold. it found them for the most part unprepared, and quite without alternative proposals. They did succeed in producing certain amendments; but under the circumstances, they could not but put up with the scheme.

Here is a classic instance in which the con sumer took charge. He did this, and imposed his will on the producer, because the producer had done nothing effective for himself. In a world which is at present in most unstable equilibrium, which is being lifted this way and that by the pressure of contending forces, it offers a lesson, on which there is no need to dwell in this assembly. Probably the reaction against a system of health insurance would be much the same here as in Britain. But it would be decisive, on one condition only. The producer could meet on equal terms with the consumer, if his plans already provided for the public health, with such completeness and economy that an arbitary panel system offered *nothing*. Here indeed, group action vindicates itself.

CARCINOMA OF THE PROSTATE

Jas. C. McClelland, M.D.

Toronto

It is my intention in this paper to take up particularly the clinical aspect of carcinoma of the prostate with special reference to its diagnosis.

Frequency

The frequency of cancer in enlarged prostate varies from Young's figures of 21% down to those of the Institute of Anatomy in Munich which showed 2%. Most authorities' figures as to frequency are in the neighborhood of 15%. Thus we see that carcinoma of the prostate is not an uncommon disease.

Pathology

It begins as a small nodule in the posterior lobe, and from here it follows the planes of least resistance. Judd says in his paper before the Southern Surgical and Gynecological Association in 1914, "the malignant process always started in the posterior lobe, and was often distinctly separated from the rest of the gland which was not involved." He thus confirms the discovery of Young and Geraghty that the carcinoma originates in the posterior lobe but may spread to other parts of the prostate. It may infiltrate upward into the region of the seminal vesicles leaving the prostate at the entrance of the ejaculatory ducts with the trigone anterior and the fascia of Denonvillier posterior. The seminal vesicles do not become infiltrated but cancer cells may gain access to the lumina of the vesicles and ejaculatory ducts. The musculature of the trigone and bladder together with the peritoneum may be involved. The rectum is rarely, if ever, involved owing to the protection given by the two layers of the fascia of Denonvillier. The carcinomatous infiltration may also go distal to the prostate and involve the membranous urethra.

Glandular metases are found clinically in 20% of cases, these being in the inguinal, iliac, cervical and retroperitoneal glands. In the post-mortem room, Pasteau reports glandular involvement in 85% of 71 cases. Bony metastases are found to go to most of the bones of the body. Blumer in his series names, in order of frequency, the vertebrae, ribs, pelvis, femur, skull, sternum and humerus.

Hypertrophy is associated with cancer in 61% (Young) of cases. This is important from a diagnostic standpoint as we will see later.

Symptoms

The early symptoms are the important ones in most diseases and those which make us suspect some pathological process. So it is with any urinary disease and especially with carcinoma of the prostate. Thompson Walker gives as the earliest symptom in his series, difficult micturition. There is a delay in the starting of the stream, small force and dribbling at the end of urination. Young gives frequency as his earliest symptom. The patient rises to urinate first once each night and gradually increases until he may be getting up several times. There may also be day frequency, and gradually, the patient may find greater and greater difficulty in emptying his bladder until the day comes when he cannot start the stream-------retention.

As the growth involves its musculature the sphincter becomes rigid, control of urination is difficult and we get dribbling continuously. Pain is sometimes the initial symptom. It may be unconnected with micturition or the flow of urine, dull in character and persisting over months or even years. It is situated in many and various places such as the penis, rectum, sacrum, hip-joint, perineum, thighs, testicles, urethra, anus, sacro-iliac synchondrosis, suprapubic region, groin, legs, shoulder joints. Sciatica may be the constant symptom.

Haematuria is more a symptom of prostatic hypertrophy than of carcinoma. Haematuria is rarely present in an early case and is seldom found in cases which are solely carcinoma and not mixed with hypertrophy. As the growth infiltrates and narrows the urethra the size and force of the stream will become smaller and smaller until acute retention is present.

Physical Examinations

A patient consulting a physician or surgeon complaining of any urinary symptom should have a complete examination of that system to determine the cause of his trouble. In men over 50 years of age, one should suspect prostatic disease in one form or another the minute they have a regular frequency of once each night or any of the cardinal urinary symptoms. This should lead to an examination of the urinary system. Have the patient stripped and palpate the region of both kidneys, both flanks, suprapubic region, both inguinal regions, hernial rings, penis noting any abnormality of the foreskin, glans, meatus, urethra and corpora cavernosa. The urethra can be palpated back to the perineum and later when a rectal examination is made the remainder can be felt and abnormalities noted. Both testes, epididymes, vasa deferentia should also be palpated. The patient is then asked to void urine into three sedimentation glasses and the characteristics of each glass is noted. If the third glass is cloudy, (the urine from the bladder) the cloud must be due to urinary salts, pus or blood. The usual tests are applied to determine which of these is making the urine cloudy. Then one comes to the rectal examination, a procedure which is very important from our standpoint.

Rectal Examination

Note the presence or absence of haemorrhoids, the tone of the sphincter, the membranous urethra and regions of Cowper's glands. As the finger follows up the membranous urethra it comes to the tip of the prostate. Take a general survey of the prostate to ascertain its size, then note the median furrow, swing over to the right lobe and note any areas of induration, their size, shape and consistence, or adhesions to the lateral pelvic walls. Next examine the left lobe in the same way. Then pass the finger up to upper border of the prostate and very gently swing the finger to each side and note the seminal vesicles. If there is any induration in the vasa deferentia they can be palpated more to the median line than the vesicles.

With a series of symptoms which point to some pathological change in the prostate, we cannot make a definite diagnosis without the physical examination, the most important part of which is the rectal examination. In fact, with one exception, the only definite means of diagnosing carcinoma of the prostate is by rectal examination.

In further examining the prostate one must note the consistence, contour of the surface, size of the prostate and any invasion of the surrounding structures. The consistence of a carcinomatous nodule is cartilaginous or almost stony hard. There may be some resilience beneath this stony hard area but one must bear in mind the possibility of some adenomatous hypertrophy beneath the nodule. Several of these nodules may be present and may coalesce giving a slight indentation in the surface and thus a nodular contour. If the area above the prostate between the vesicles and the trigone is involved, one gets the hard area extending up on one or both sides like horns or wings from the upper border of the prostate. There may also be an infiltration and hardening of the area between the vesicles giving an area of induration called the intervesicular plateau. In the mass felt by rectum it may be impossible to distinguish the outlines of the prostate. There may be adhesions to both sides of the pelvis showing a very firm fixed mass. The membranous urethra may be infiltrated also showing it as very firm, hard and inelastic. A very important sign of carcinoma of the prostate is that brought out by Dr. Geraghty of Baltimore.

With the finger in the rectum and the cystoscope in the urethra (or any other metal instrument) the whole of the membranous urethra, prostate and intervesicular space is palpated and any nodules or areas of induration between the instrument and the fingers noted. The beak of the cystoscope can be turned toward the finger and the infiltration beneath the trigone felt. This is a very important sign in the early diagnosis when there is no extension of the carcinoma from the prostate and a small nodule is present in the posterior lobe. This nodule can be definitely located between the cystoscope and the finger, its consistence noted and a diagnosis made.

Very often there is great difficulty in passing a cystoscope or a sound in these cases. It is a sign of closing of the posterior urethra by the carcinomatous infiltration around it. The cystoscopic picture may show some adenomatous lobes encroaching on the internal meatus, but as the carcinoma rarely involves the bladder mucosa it is not of much help in diagnosis.

Another type of carcinoma is the round, smooth, hard prostate. This is small and does not show localized areas of hardness but gives one the first impression of a small hypertrophied prostate though there is not the elasticity on pressure that one gets in the adenoma but rather the hard cartilaginous consistence of the carcinoma. This will also involve the region of the vesicles by a similar hard smooth area continuous with the prostate. This type offers the graver prognosis as metastases occur earlier.

Differential Diagnosis

One is sometimes called upon to make a differential diagnosis between adenoma, tuberculosis, chronic inflammation and carcinoma. The adenoma is firm, hard, elastic with a smooth contour and no involvement of the vesicles. The chronic inflammatory prostate may be large and boggy but is usually indurated in small areas with induration and slight hardness in the vesicles. Adhesions to the lateral pelvic walls are also present. The prostatic secretion will show many pus cells. It is sometimes a very difficult problem to differentiate carcinoma from chronic inflammation but after going into the history and a thorough examination, a diagnosis can be made. A tuberculous prostate is often accompanied by a tuberculous epididymitis. If not, the induration which extends to the vesicles and vasa deferentia is smooth, not very hard but of a degree between that of the chronic inflammatory and the carcinoma.

Treatment

The operative procedure depends entirely on whether the carcinomatous process is confined to the prostate or not. Unfortunately, we see very few early cases of carcinoma of the prostate. If it is confined to the prostate, one may do Young's radical prostatectomy. If it has extended beyond the prostate, one is dependent entirely on the patient's symptoms as to procedure. There is usually a stricture of the prostatic urethra and acute retention. One can make a permanent suprapubic opening or do a perineal operation in which the whole of the prostate urethra is gouged out with a bone curette and greatly enlarged with removal of a large amount of prostatic tissue.

Radium

Radium has been used a good deal for carcinoma of the prostate. It is used in large ampules, as small tubes containing the radium emmanations and needles which are inserted into the substance. In no case has there been a definite cure but there are a great many instance of marked decrease in the size of the growth and alleviation of the symptoms.

Case Reports

OBITER SCRIPTA

Being Abstracts from Case Reports in the Medical Clinic of the Royal Victoria Hospital

C. F. Martin, M.D.

Case 1.—*Multiple Arthritis treated by medical drainage of the gallbladder owing to the discovery of an infected gallbladder in the course of routine examination for an infected focus. Cure almost complete within a few weeks.*

A. E., age 28, was admitted to the Hospital in December, 1921, complaining of painful swelling of the joints of the feet, and fixation of the jaw. His illness had started in the previous July when stiffness in the left maxillary joint appeared, causing considerable pain. Within a short time the movements of the jaw were much restricted, impeding both speech and swallowing power. From this he gradually recovered until November, when there was a recurrence of stiffness in the jaw, and pain in the right ankle commenced. From that time on, up to the date of his admission, there had been more or less trouble both with the joints of his feet and more or less fixation of the jaw. No other joints were affected.

A careful examination revealed no abnormalities in any of the viscera, nor could any of the ordinary avenues of infection be found to reveal signs of disease:—The teeth and accessory sinuses were normal to all the usual methods of examination; the genito-urinary system was found to be normal, while in the intestinal flora there was no evidence of a focus of disease. The blood content of uric acid was 1.96 grs. per 100 c. c. of blood, a normal finding. In the absence, then, of any evidence of focal infection, drainage of the gallbladder was carried out by means of the Rehfuss tube and showed definite evidences of infection of the biliary tract. Examination of the fluid by Dr. Henderson showed the specimen to contain many evidences of inflammation in the cellular content, and cultures revealed the presence of B. Coli Communis (A. Indolic). Medical drainage of the gallbladder was carried out, the joints yielding rapidly to the treatment within the first fortnight; the maxillary joints became free from evidences of disease, and the ankle joints subsided shortly afterwards.

The patient left the hospital on January 28th, 1922, almost entirely well, carrying with him an autogenous vaccine and tube to carry out his own medical drainage from time to time.

Note.—This experience has been repeated in other cases—where however a definite history of gallbladder infection was elicited.

Case 2.—*Remarkable Case of Post-operative Intussusception of the Small Intestine, with Spontaneous Discharge of the Intussusceptum—27 inches long. Immediate Relief of Symptoms. Patient discharged from Hospital feeling well.*

Mrs. M. M., 26 years of age, was admitted to the Hospital in March, 1922, complaining of abdominal pain, nausea and vomiting.

Since childhood she had had recurrent attacks of chronic appendicitis, the appendix being ultimately removed in 1919; at the same time, a small ovarian cyst, the size of an egg, was found and excised.

In April, 1921, during her third pregnancy, she suffered a severe injury to the abdomen, caused by a barrel falling upon her. This was immediately followed by severe pain, nausea and vomiting, and after five days the abdomen presented signs suggesting the need of an immediate operation. The surgeon in charge at the time, in her home town, exposed the abdomen, and rectified what he regarded as a diverticulum partially invaginated, lying behind the uterus. Labour occurred at the normal time, and a living child was delivered.

In November, 1921, the third operation was performed, and a number of stones were removed from the gallbladder. No obstruction was found, but the caecum, which was noted to be exceedingly movable, was plicated back into position, and after a stormy post-operative course, she was discharged from her hospital in good condition.

On admission to the Royal Victoria Hospital in March, 1922, she was again suffering from severe epigastric pain. She stated that for some weeks past she had suffered from nausea and vomiting, for which her physician was obliged to give her morphia at frequent intervals. The abdomen itself, while somewhat distended, was not rigid either locally or in general, but on palpation there was a sense of cushion-like fulness in the lower right iliac region and hypogastrium. The temperature varied in the neighbourhood of 100°; the pulse was 100, and the respirations 22.

A barium meal given a few days later showed the stomach to be normal in its motor function. The colon, however, was filled with barium and gas, the opaque fluid showing itself in tiers, terraced, as it were, one loop above the other centrally in the abdomen. The course of the colon seemed tortuous and the muscle atonic. Evacuation, however, was but slightly delayed.

The constipation of the first ten days was followed by diarrhœa for one week, there being nothing specially abnormal in the stools. A pelvic examination showed no sign locally of the etiological factor, and on March 17th, she was given an ounce of castor oil, and three hours later passed 2 ft. of mottled, blackish-grey, necrotic small intestine, the whole lumen of which was almost intact. The mesenteric border of the specimen was quite distinct. At one end a definite lumen was present, 2 ins. in diameter, becoming suddenly narrowed for 9 ins., followed by a pouch like dilatation, which contained a solid oval, greenish mass of fæces 3 cm. long and 1.5 cm. in diameter. Beyond this pouch, which was 3ins. long, the gut was again contracted to 1 in. in diameter for 3ins.; again a pouch-like dilatation followed upon this, but was empty at the extreme end of the specimen, the lumen becoming more solid, necrotic fusion having apparently occurred. Microscopic examination of the specimen showed all three layers of the small intestine definitely enough to be recognized, though, naturally, the mucosa was necrotic throughout. (Report by Prof. Oertel.)

Three days later the patient's relief seemed to be complete, and she insisted upon leaving the hospital, feeling, as she thought, again in complete health. Unfortunately, this rendered a further examination by the barium meal impossible.

The subsequent history however, furnished by her physician reveals the fact that the marked improvement was rather short lived. There has been a return of the pains and vomiting, necessitating the use of sedatives. Further information is unavailable for the present.

Case 3.—From Dr. A. T. Henderson.—*Gastrectasis from Spastic Pyloric Stenosis due to Duodenal Ulcer. Visible Peristalsis for Two Years without special digestive symptoms or discomfort. Gastro-enterostomy after two years. Complete Cure.*

The patient was a man 60 years of age, who—in December 1919—consulted his physician for a slight attack of diarrhœa and some mild gastric discomfort, followed by vomiting on one occasion only. There were noticed in the vomitus the skins of some fruit taken 48 hours previously, and believing that the man had some dilatation of the stomach, he was sent into hospital.

On admission it was found that all his organs, with the exception of his stomach, were normal. On examining the abdomen, however, one saw distinct evidence of peristalsis, and both the barium meal and the gastric analysis showed evidence of a very definite benign stenosis of the pylorus. The acidity was abnormally high and the gastric delay nearly 40 hours. At that time operation was suggested, with a view to performing gastro-enterostomy, but as the patient declined this form of treatment, nothing was done, and he was discharged, feeling—according to his own statement—"as well as he ever did." From this on to the present time, *i. e.* for two years, he has suffered practically no inconvenience except an occasional slight indigestion; there was never any vomiting and only a very slight loss of flesh; the bowels moved daily without much aid, and the patient travelled about the country and carried on his routine as though he were in perfect health.

On December 12th, 1921, after a few days of indigestion, with flatulence and some regurgitation of food, he was seen again and admitted to hospital for the second time. On this occasion even greater gastric distention was found and the same marked visible peristalsis; there was some resistance in the right upper quadrant, but no mass was felt. Fractional analysis showed a very marked retention in the early morning, with total acidity of 70 and a free hydrochloric acidity of 45, the gastric curves remaining high after two hours. Microscopic examination shewed occult blood, abundant sarcinæ and a few yeast cells. The barium meal showed gastric retention after 70 hours.

After a period of observation, during which he suffered no special discomfort, he was referred for operation. At the operation the pylorus itself was found quite free, but a definite chronic ulcer of the duodenum was present—about $1\frac{1}{2}$ inches beyond the pyloric opening but so small as to cause no diminution of the lumen. A gastro-enterostomy was performed, and the patient made a good recovery and has been steadily gaining in weight ever since.

Note.—This case is of special interest as illustrating the degree to which gastrectasis may occur without causing any special discomfort for years. Undoubtedly the visible peristalsis was due to spasm and not to any organic narrowing of the orifice, for the duodenum itself was quite patent, in spite of the scarring ulcer.

A NOTE ON THE INCUBATION PERIOD OF ENCEPHALITIS LETHARGICA. REPORT OF A CASE DEVELOPING WITHIN FIVE DAYS OF EXPOSURE

Forbes Godfrey, M.D., *Mimico*,
and
N. B. Gwyn, M.D., *Toronto*

Miss S., nurse, came early in December complaining of double vision, fever and weakness, she had been nursing a case of encephalitis in Mimico. After five days on the case she was taken with fever, headache, malaise, and weakness, then with persistent vomiting. Three days later she came to hospital and en route noted the diplopia. This was, however, only temporary and all symptoms seemed to clear quickly; she went out after a week, but the double vision came on again very acutely giving her vertigo, and when seen, her eye was still black from a collision due to the distorted vision. There was difficulty in writing for a time. She again improved quickly, and on examination later there was only to be seen a droop of the left eyelid, plus a weak left internal rectus. She complained of dim vision. No abnormalities of reflexes, no further motor or sensory disturbances could be made out. On December 30th, she complained of sleeplessness and anxieties; the vision had cleared, she was however, much depressed. Lumbar puncture at different times gave a large amount of fluid under pressure, with distinct turbidity, a few red cells, and a positive globulin. Blood and fluid both gave negative Wassermann. By February 1st, 1922, she had cleared slowly, though she had had recurring headaches and sciatic pain for three or four weeks, there had been no more fever. About this date there was a sudden relapse,—severe headache, vomiting, pain in right leg, pain and tingling in both arms; there was a distinct weakness of right eyelid and right internal rectus, but the nerve heads did not look more than slightly congested; there was some double vision. Temperature 101°. From this time on patient showed marked weakness and took many weeks to regain her strength, making eventually, however, a complete recovery. The eye condition, the headache and sciatic pain have completely gone.

This case is of the greatest importance in considering the period of incubation of encephalitis; there are few opportunities of determining accurately this period of the disease; of further interest was the first report of Dr. McCallum on the eye condition. The headache, vomiting, and early stage of optic neuritis were severe enough to suggest to him an acute cerebritis, or a brain tumour. The subsequent course of the disease with its relapses, negative Wassermanns, recurrence of eye signs and eventual cure, would seem to leave no doubt as to the nature of the case. We were fortunate in having Dr. Goldwin Howland's confirmation of our ideas.

The case on which this nurse had been in attendance seemed to have been a very severe case of encephalitis. Doubt existed for the first day or two on account of the patient's early history. She had had signs and suspicions of kidney damage with high tension for some time. In addition to this she had been taking veronal, and had been in the habit of taking alcohol from time to time. Three days previous to the time of the writers' seeing her, she had begun to feel unsteady on her legs, and a little later was seeing double, by night time she was unconscious, there was stertor, and the urine showed distinct trace of albumin. At the end of three days she was still unconscious with a droop of the left eye, weakness of the right internal rectus, and congested discs, she was quite incontinent, and both legs were in a condition of absolute flaccidity with absent reflexes. There was nothing more to be made out in the eye grounds. Systolic blood pressure was 170. m. m. There was fever 103°, and an acute dry pleurisy on the right side. Three days later she seemed much better, the legs could be moved normally, the reflexes were active, there was no Babinski, she was conscious, was able to control her bladder, there was still some droop of the left eyelid, and the fever had disappeared. From that time she improved quickly, although there still remained a sluggishness of the intellect, and at times an inability to appreciate the nature and use of objects. After three weeks she began to show lethargy and weakness, with incontinence of urine and feces, fever reappeared, as did the droop of the left eyelid, and there was complete inability to protrude tongue; she seemed quite unable to speak, pupils were equal and reacted well, there was weakness of the right arm, the legs were now somewhat stiff, there was no Kernig's sign and no rigidity of the neck; reflexes were all increased in the limbs, but the abdominal reflexes were completely absent. Patient remained in this condition for three or four weeks, seeming quite unable to speak or to understand. Improvement then set in, and patient is now apparently quite well, though it is still to be noted that at times she will be easily bewildered for a few seconds, and unable to appreciate the proper nature and use of certain objects. Wassermann of both blood and spinal fluid was negative. Spinal fluid was under pressure, was clear and filled two large test tubes, there were sixty cells per c. c. m. largely polymorphonuclear, the urine had cleared completely, the incontinence of urine and feces disappeared, and the paraplegic symptoms have disappeared. This case is of particular interest on account of the antecedent history. The relapse, the fever and signs of infection, with the multiform involvement of the nervous system make a very complete picture of encephalitis, hardly needing the infection of the nurse for its confirmation.

Retrospect

THE ETIOLOGY OF CANCER

Wm. Boyd, M.D.

The essential cause of malignant disease is still completely unknown. The importance of certain predisposing etiological factors, such, for instance, as irritation, is fully recognized, but the veil covering the mystery of the exciting factor which leads to the unlimited cellular proliferation has not yet been rent in twain.

The idea that the unknown stimulus may be due to the action of some hitherto undiscovered microorganism has of late hardly received the attention it merits. When the data recently presented by Emery and other writers is summarised, the result is a mass of evidence which deserves serious consideration.

The microorganism must be so small as to escape detection, but this is true of many of the filter-passers. It must inhabit the cell, and multiply within it, so that when the cell divides each of the daughter cells is also infected. It must produce a toxin with the power to induce cell division.

If each cell contained only one microbe it would be difficult to conceive how both should subdivide at the same moment. But there is no reason why there should be only one. The pus cells in gonorrhœa, the specific cells in rhinoscleroma, are loaded with bacteria. In tropical sore a single cell may contain from 100 to 200 organisms.

The production of cellular proliferation by bacterial toxins may be observed in any case of chronic inflammation. The formation of giant cells in tuberculosis affords a familiar example of this process. Scharlach R when applied to an epithelial surface causes a continuous proliferation of epithelial cells which may bear a strong resemblance to the proliferation seen in an epithelioma. Even more striking than the action of Scharlach R on epithelium is the recent experimental production of carcinoma by the application or the injection of tar. Granted a bacterium which has a continuous stimulating influence on epithelium like Scharlach R, and provided it can live and multiply in a cell, the result will be a neoplasm.

Many conditions now known to be infectious in nature can with difficulty, if at all, be distinguished from true neoplasms. Warts are known to be due to an infection, they can be inoculated from one person to another, and yet they are identical both macroscopically and microscopically with a papilloma. Molluscum contagiosum is due to an unknown filter-passing organism, but it bears the closest resemblance to an innocent epithelial tumour. Coccidiosis of the liver of the rabbit produces an appearance identical with that of a complex papilloma such as a papillary tumour of the bladder, so that if the cause was not known to be a protozoon the condition would be regarded as a true neoplasm. The infective (venereal) sarcoma of dogs is histologically a true tumour, a round-celled sarcoma, but it is certainly infectious in nature. Rous' chicken sarcoma probably belongs to the same category. Vegetable galls, which are organised structures rather than mere masses of hypertrophied tissue, are due to the action of a toxin injected by an insect when the embryo is deposited. Indeed all the principal features of true tumours can be paralleled by plant conditions which are known to be due to parasites. The researches of Erwin Smith have shown that when the proper species of plant is inoculated with Bacterium tumefaciens of crown gall, a growth will result which bears a strong resemblance to mammalian cancer. Moreover, the secondary growths which develop are not produced from the tissues where they are found, but from that of the primary tumour. A secondary growth on a leaf is composed of root cells if the primary growth arises in the root, or of stem cells if the growth begins on the stem.

The common sites of tumour growth appear to point to a possible bacterial cause. The parts of the body liable to infection are the common sites of primary tumours. The mouth, the stomach, the rectum, the uterus, the breast, all in free communication with the exterior, are the most frequent sites of carcinoma. The small intestine, the urinary bladder, and the gall bladder, in which the communication is less free, are less commonly affected. The relation between gall stones and carcinoma, and between gall stones and infection, is well recognised. Such organs as the spleen, the liver, the brain and spinal cord, the heart, and the muscles, all more or less isolated from the exterior, are rarely the seat of primary growths. Yet the liver possesses no natural immunity, for it is one of the organs most frequently affected by secondary growths. It is curious to recall that tumours of ciliated epithelium (nose, bronchi, Fallopian tube, vas deferens), are extremely rare, whilst tumours of all other kinds of epithelium are equally common. May it be that these ciliated cells are better able to protect themselves from invasion?

Ochsner has recently called attention to some racial characteristics which are of interest. Cancer of the stomach is very common in what he calls manure-eating peoples. It is common, for instance, amongst the Japanese who eat raw vegetables grown in soil fertilised with human or animal manure. It is remarkably rare in India, where their religion makes the people boil their food and drink. On the other hand the Japanese, who are scrupulously clean and wash in hot water, are singularly free from cancer of the skin, a condition which is very common in India where the skin is frequently very dirty. Cancer of the stomach is very rare in the tropics, except where vegetable gardens are conducted by the Japanese and Chinese. In the tropics human excrement is not needed to fertilize the soil. Gastric cancer is common in manure-eating animals, such as fowls and pigs. Marine and Gaylord have shown that fish living in ponds infected with fæces develop cancer of the gills, whereas control fish in pure water do not.

It may be urged that if tumours are infectious in nature, they may be transmitted from one patient to another. But a slight knowledge of the history of medicine will show that there may be nothing so difficult as to prove the communicability of a disease. As late as 1891 one of the standard text-books of medicine stated in the most categorical manner that phthisis could not possibly be an infectious disease. What case is known of a carbuncle being communicated from one person to another, and yet it is certainly bacterial in origin? Moreover, the possibility of cage infection in laboratory animals appears to be definitely proved. Cages which have been inhabited by cancerous mice show an undue proportion of positive cases. Loeb has recorded three cases of cystic sarcoma of the thyroid developing in rats in adjacent cages, an occurrence all the more extraordinary when it is recalled that spontaneous tumours in rats are very rare, and that this variety of tumour is even rarer.

The evidence in favour of the bacterial causation of tumours is in no way overwhelming. There are many grave difficulties which could readily be urged. It is merely intended to point out that there is more to be said for this view than is usually admitted in text-books of pathology, and that the only wise course is to maintain an open mind.

Editorial

PANCREATIC EXTRACT AND DIABETES

THE treatment of diabetes consists in a reduction of the amount of carbohydrates and, if necessary, of protein in the diet to such a degree that the percentage of sugar in the blood returns to the normal level. When this is accomplished the functions of the body which control the metabolism of carbohydrates are relieved of the overstrain under which they have become progressively more and more weakened as the disease progresses. The rest afforded these functions by reduction of the diet allows them to recuperate, so that after some time it is not infrequently the case that some carbohydrates can again be tolerated without producing any of the symptoms of the disease. It is usually considered that some structure in the pancreas (the Isles of Langerhans) forms the organ which controls these functions, and that it accomplishes its work by means of an internal secretion. Final proof of this hypothesis has, however, been lacking, for although experimental diabetes of an extremely acute type inevitably follows complete removal of the pancreas in laboratory animals, and diabetes mellitus in man is frequently found to be associated with pathological changes in this gland, it has until recently been impossible to show that administration of an extract of pancreas has any constant and significant effect in reducing the disturbed sugar metabolism or in ameliorating any of the other symptoms of diabetes.

At intervals since 1887, when Minkowski discovered that excision of the pancreas in dogs causes diabetes, attempts have been made by numerous investigators to supply the evidence of an internal secretion. Some of these attempts have been crowned by a certain amount of success; notably, among recent investigators, those made by Knowlton and Starling, Kleiner, Murlin, E. L. Scott, and Paulesco; but so far as can be ascertained, the results have been considered, often by the authors themselves, to be insufficiently constant and significant to justify more intensive research with the object of securing preparations of greater potency that could be used for the treatment of diabetes in man.

In a paper appearing in the previous number of this Journal are given the results of a remarkable series of observations emanating from the physiological and pathochemical laboratories and the medical clinic of the University of Toronto, by F. C. Banting, C. H. Best, J. B. Collip, W. R. Campbell and A. A. Fletcher, in which it is shown that an extract of pancreas can be prepared capable of removing all the cardinal symptoms of diabetes both in animals and man. Thus, it caused the blood sugar to return to the normal level, the sugar of the urine to disappear, acetonuria to vanish and the respiratory quotient to rise towards its usual level. Not alone were the objective symptoms relieved, but the well-being of the patients definitely improved. The extract was administered subcutaneously. These clinical observations would not have been warranted had Banting and Best not previously shown by experiments on diabetic (depancreated) dogs conducted in the laboratory of the writer, that in one animal at least, by daily injections of extract, life could be prolonged far beyond the time during which untreated diabetic animals usually live.

Many other corroborative results of the remarkable potency of pancreatic extracts have been gathered, and great attention is being given to the best method of their preparation in bulk. It has been thought advisable not to publish these methods in detail until they have been thoroughly worked out and the proper dosage determined; for it has been found not only that toxic symptoms may follow the administration of improperly prepared extracts, but that the antidiabetic effect is readily lost by apparently trivial deviations from the prescribed method. This large scale preparation of the extract is being done in the department of physiology by the aid of funds granted by the Connaught Laboratories of the University of Toronto.

As is frequently the case on passing from small to large scale production great difficulties were encountered, so much so, indeed, that for over two months it was impossible to obtain extracts of anything like the potency of those used in the above referred to observations on diabetic patients. There is reason to believe, however, that these difficulties will soon be overcome and that details of the method of preparation of the extract can be published in detail. Meanwhile a sufficient amount of extract has been available to continue with the laboratory observations and many significant results have been obtained. These are important not only because of their scientific interest but also because they indicate the clinical possibilities of the extract.

The large amount of information collected has been the result of excellent team work by a group of workers including besides those already mentioned, J. Hepburn, H. K. Latchford, E. C. Noble and the writer. Briefly, the most significant of the results which have been obtained are as follows: Subcutaneous injection of the extract into normal rabbits causes the percentage of sugar in the blood to fall, and when this reaches a certain level (about 0.045 percent.), perfectly characteristic symptoms of a convulsive character appear and, if left alone, the animal passes into a comatose condition, which soon ends in death. If a solution of sugar be injected subcutaneously when the symptoms appear, the animal immediately recovers and may remain perfectly normal or pass again into the convulsions which may be removed a second time by injections of sugar. Many observations have convinced us that these symptoms are definitely related to the lowering of blood sugar—they may indeed be called hypoglycæmic convulsions—and this is all the more interesting in light of the work of F. C. Mann who found similar symptoms to develop in dogs when the blood sugar was lowered to about 0.04 percent by isolation of the liver from the circulation. The discovery of this effect on normal rabbits has proved a most important one in connection with the isolation and purification of the extract, since it affords a readily available laboratory test object. It obviates the necessity of using depancreated dogs for testing the potency of the extract and therefore has greatly facilitated our work. As is to be expected an extract which acts only feebly on normal rabbits has a much more pronounced effect on the hyperglycæmia of diabetic dogs.

Not only is the blood sugar lowered in rabbits that are normal but also in those rendered diabetic by any of the experimental methods usually employed to bring this about. These are puncture of the floor of the fourth ventricle (Piqûre), asphyxia, poisoning by carbon monoxide gas, ether, or adrenalin. None of these causes hyperglycæmia in rabbits after injecting them with sufficient amounts of pancreatic extract. There may occasionally be a slight increase in the percentage of blood sugar but never to anything like the extent usually observed without extract. The animals used for these experiments were always well-fed with carbohydrates and the glycogen content of the liver determined. The importance of this result is that it shows us that even the purely experimental forms of diabetes have much in common with the clinical forms.

Determination of the percentage of glycogen and of fatty acid in the liver, heart and blood of diabetic animals either injected or not injected with extract has revealed the fact that extract entirely alters the distribution and amount of these substances. Thus, the liver of a pancreatic diabetic dog never contains more than a very small amount of glycogen even when the animal has been ingesting large amounts of carbohydrate; on the other hand this organ under these conditions is heavily loaded with fat. When extract is given, however, a very large amount of glycogen (over 12 percent.) appears in the liver and the amount of fat coincidently declines. At a certain stage in the treatment, of course, considerable amounts of both fat and glycogen may be present side by side. The blood of untreated diabetic dogs (depancreated) contains about two percent. of fatty acid indicating a marked lipæmia, but if extract is given this disappears down to about 0.5 percent. The heart of untreated diabetic animals contains the highest percentage of glycogen of any organ in the body but this becomes markedly lowered after treatment with extract.

The importance of these observations rests on the fact that they show that the function which is primarily regulated or controlled by the internal secretion of the pancreas is that concerned with the deposition of glycogen. They would seem to suggest that glycogen must be an essential preliminary stage in the utilization of sugar by the animal body and that when the pancreatic hormone is absent excess of sugar leads to the mobilization of large quantities of fat.

The various effects which are described above all indicate a profound influence of some constituent of the pancreas on the earlier stages of carbohydrate metabolism, namely, the glycogenic function and the blood sugar level, but it might well be that these could be affected without there being any change in the ultimate utilization of sugar by the tissues. This latter process is after all the most important one and its partial or complete failure is the most striking symptom of diabetes. The extent of this combustion of sugar in the body is gauged by determining the respiratory quotient which is done by analysis of the expired air to find out how much carbon dioxide is being given out and how much oxygen is being absorbed by the body. This should always be done by reliable apparatus and by trained observers. In a normal person or laboratory animal fed on carbohydrates the quotient (R. Q.) rises nearly to 1.0 but in a diabetic patient or animal it fails to do so and may be as low as 0.65 its height varying with the severity of the disease. When pancreatic extract is administered along with carbohydrates in diabetes, on the other hand, the quotient rises as in a normal person clearly indicating that utilization of carbohydrate in the tissues has been restored.

In the light of these various types of evidence we feel justified in expressing the belief that it will be possible by administration of pancreatic extract, to treat diabetes in man much more satisfactorily than has hitherto been the case. Dietetic control must no doubt still remain an important feature of treatment, and will probably be all that is necessary in the earlier stages of the disease but in the later stages and in the various crises that are otherwise unmanageable it is hoped that administration of extract will prove of value. What other therapeutic uses the pancreatic extract may have remains as yet undetermined.

J. J. R. MACLEOD

TREATMENT OF DIABETES MELLITUS BY PANCREATIC EXTRACTS

WITH the recent communication from the Toronto School in the March number of this Journal, upon the treatment of diabetes mellitus, one naturally wonders whether a new era in medical history has been opened. We feel that they are working along the correct and rational lines for the ultimate solution of the problem, but from published data such has not been reached as yet.

It would appear that a potent extract with low toxicity of the internal secretion of the pancreas has been prepared, and that this extract can be safely used by subcutaneous injection in the human being. Further their results show that it has a marked but temporary lowering effect upon the percentage concentration of the blood sugar with a resultant decrease in glycosuria and an improvement in the degree of acidosis. Its effect upon the respiratory quotient shows that it actually increases the amount of carbohydrate oxidised in the body.

All of this work is very encouraging and the whole medical profession awaits its perfection. For a method of treatment to be satisfactory first it must be safe, necessitating in this instance the uniform preparation of a non-toxic extract. Secondly, a treatment which would necessitate frequent subcutaneous injections is always handicapped at the outset. Nevertheless, let us hope that the group of Toronto men will be able to overcome these difficulties and provide the profession with means of effectively treating this widely distributed disease, which for many years has been the subject of intensive study by chemists and pathologists.

THE AFTERMATH OF ENCEPHALITIS LETHARGICA.

WHETHER we accept the view that Encephalitis Lethargica is a new disease, or adhere to the belief that its present widespread incidence is merely the periodic manifestation of an old but hitherto unrecognized disease process, we must acknowledge that no disease of the central nervous system since its first description by Economo, has commanded the scientific attention of the medical world to a similar extent.

While the acute infection has been, in itself, of outstanding interest, attacking the cerebro-spinal axis wheresoever it would, and with an apparent disregard for structure, though frequently manifesting a preference for the midbrain and pons, this stage of the infection by no means absorbs our entire interest.

While it appears that the incidence of the acute stage is at present on the wane and, while there is always the danger of overworking a new conception of disease in our quest for the cause, any large neurological clinic of to-day presents ample evidence of the passing of the serpent. This evidence is afforded by the number of clean cut sequelæ which are encountered months after the acute stage has subsided which point to the unobserved or unrecognized significance of a past fever or grippal attack.

Were it possible to re-examine all the cases that have passed under this diagnosis in the past three years, the writer is convinced that the early optimism with which the diagnosis of encephalitis lethargica was regarded, would receive a severe shock. True, many cases have recovered and many have passed from our observation well on the way to recovery, but the frequency with which we encounter psychic or structural defects, that can be rationally attributed only to a former attack of encephalitis is daily becoming more striking and more alarming.

Among the various and complex types of sequelæ that follow in the trail of the acute infection, the so-called paralysis agitans syndrome stands out as the most important. The simple complaint of weakness of the legs with an instability of station, or the appearance of a slight tremor occurring some months after an attack of fever with or without its concomitant lethargy, is only too ominous an indication of a progressive pathological lesion, and the rapid development into the classical Parkinsonian complex of symptoms only too readily confirms one's suspicion. This complete syndrome is so identical, clinically, with that of the true Parkinson's disease that a differential diagnosis is, sometimes difficult. However, with the history, the age incidence, the suddenness of onset, the absence of the slow hemiplegic progression from limb to limb, so typical of paralysis agitans and, particularly, with the signs of a more extensive involvement of the brain structure than the basal ganglia, the greater number of cases, manifesting a pathological lesion in the corpus striatum, can be properly classified. In almost all cases, in which the basal ganglia are the chief seat of the disease, it should not be difficult to recognize the classical features of the Parkinsonian pictures. The muscle rigidity, generally more marked in the back and neck muscles, the loss of associated movement and poverty of voluntary movement, the typical attitude and facies and the varied types of tremor leave few signs that are peculiar to the real disease. Yet, rarely do we find the syndrome uncomplicated by the signs of a more wide-spread involvement. Probably, the one most commonly met with is an implication of the pyramidal system, which may be unilateral but more frequently is bilateral; of the cranial nerves, the third and seventh have been observed most frequently to be the seat of signs of residual involvement.

In one case, that of a young girl, the picture was indistinguishable from that of true Parkinson's disease but, as evidence of further involvement of the brain axis, she had developed a spasmodic tic-like deviation of the mandible to the right. Though the history of a previous infection was lacking in this case, the age of the patient and the associated involvement of the trigemminal nerve served to classify the case as one of encephalitis.

Next in frequency, if not in interest, are the various psychic disorders that appear to have their origin in an acute attack, though separated from the period of convalescence by a considerable lapse of apparently perfect health. Archambault has attempted to formulate a syndrome, covering these cases, which he calls the choreo-psychotic syndrome, but in the writer's experience, the manifestations of psychic disorder have been so varied and irregular that no one syndrome seems sufficiently inclusive, as the symptoms may range from simple irritability and mild memory defect to morbid fears, marked impairment of concentration, disorientation and mild confusion; in short, the symptomology of a psychoneurosis with, occasionally, that of a mild psychosis. These patients become apprehensive and hypochondriacal. Often they take on a childish behaviour, become whimsical and emotional and, in some cases, seem quite incapable of any prolonged mental effort. Though interest in life is at a low level in many of them, marked depression is seldom a feature; the tendency is rather to become childish, irritable and peevish.

With these distinct types may be mentioned the isolated cases, in which some injury to the cranial nerves persists. Of these the third nerve easily takes first place with the seventh a close second but persistent injury to the fifth, ninth and tenth (palate) has been noted.

Not less interesting is that group of cases, characterized by a disturbance in the sleep cycle which, fortunately, is of a temporary character. In the three cases seen by the writer, all recovered in from 8 to 18 months after the infection. The subjects of this group are children who have passed through a typical attack of fever and lethargy but who, in the course of a few weeks and without apparent evidence of other mental defect, have developed a peculiar reversal of the sleep cycle. The child remains awake during the night in spite of all that can be done to induce sleep and insists on sleeping soundly throughout the day.

These are some of the sequelæ of an attack of epidemic encephalitis, as noted, from day to day, in a general neurological clinic; as time goes on, one is, more and more, struck by the diversity of the mental and structural abnormalities that may follow in the wake of the primary infection.

While some of these abnormalities are the simple and isolated happenings in the course of a general infective process, many of them constitute very definite syndromes, which in the light of past knowledge alone, would be classed as diseases. Is it then a far cry to the acceptance of the theory that many of the so-called degenerative diseases of the central nervous system, are but the result of some similar infection, and may we not with ease subscribe to the belief that such diseases as paralysis agitans, Huntington's chorea, disseminated sclerosis and progressive lenticular degeneration are but the clinical scars that mark the trail of the real disease. F. H. MACKAY

ON THE NECESSITY FOR THE CAREFUL MEDICAL OVERSIGHT OF CHILDREN OF THE SCHOOL AND PRE-SCHOOL AGE

THE large percentage of defectives revealed by the late war not only in our own country, but in all others where medical inspections were made of recruits for the army, awakened not only our profession but all thoughtful minds to the necessity for a more careful medical oversight of all children during their early years of growth.

At the present many voluntary associations such as the Canadian Junior Red Cross, the Canadian Junior League, the Canadian Committee for the Study of Mental Hygiene and others, are putting forward strong efforts to increase our knowledge of the incidence of those diseases which are apt to give rise to physical defects in the growing child; also regarding the frequency in children of tubercular infection. Assistance in these efforts is also being given by both Federal and Provincial authorities and many of our municipal bodies are contributing to the regular medical inspection of our public schools.

All this in its way is very encouraging, but both the profession and the public should recognize how much remains still to be done and how much greater efficiency may be thrown into some of the work. The great advantages arising from the regular medical inspection of public schools with follow-up work carried on by carefully trained social workers, have already been manifested by a marked curtailment in the spread of infectious disease, and the rectification of defects in sight, hearing and breathing in the scholars. The removal of these depressing conditions especially when associated with a proper dietary and good sanitary conditions at home stimulates bodily growth and mental activity and gives the children previously backward a fair chance in life.

Medical surveys also of the mental capacity of backward children in public schools by specialists have been recently undertaken under the direction of the Committee for Mental Hygiene, permitting the separation of those of defective mental powers into classes by themselves and enabling those with brighter minds to make more rapid progress.

But it is specially in reference to the incidence of tuberculosis in children of the school and also pre-school age, and the necessity for careful medical inspection and follow-up work at home that we desire to call the attention of our readers to the report of the medical examinations of nearly 1,400 children of school age in the Province of Saskatchewan. Much excellent work in the prevention of the spread of tuberculosis has been carried out in many Canadian centres by trained nurses under the Departments of Health or Education in homes in which cases of tuberculosis were known to exist, improving the nutritional and sanitary conditions, thus salvaging the lives of many children who might otherwise have fallen a prey to this fell disease. Open air schools, forest schools, and preventoria, and summer camps, have undoubtedly effected much good. In spite of these agencies statistics when available still show a high percentage of deaths in children from tuberculosis. In the Province of Ontario, the death rate from tuberculosis per 100,000 population in 1910 was 102. In 1919 in the same province, the rate per 100,000 population was 78, but the percentage of children under 5 years of age included in these figures was 6%. This age group percentage has never been below 5.2 during the ten years in question and has been as high as 7.2., in spite of the gradual decline of the general tuberculosis rate for this Province.

The Saskatchewan Anti-tuberculosis Commission have blazed the trail in the making of surveys regarding the incidence of tuberculosis in children for the whole Dominion. One of the first steps of its Chairman was to place the aims of the work and the method of dealing with it before the College of Physicians in the province, the members of which responded very promptly and gave every assistance. The result has been a most excellent and useful report. The Executive of the Canadian Association for the Prevention of Tuberculosis have appointed at their last meeting a Committee to stimulate such investigations in every province, with the object of ascertaining the incidence of the disease and if possible its principal causative factors. At the same time a survey of the amount of bovine tuberculosis in each province is most desirable.

The knowledge thus obtained will be of great value not only to the medical profession but to the country at large, pointing the way to the most effective methods for controlling this disease. We hope the different public health interests in each province will respond to the requests of this Canadian Association and realize the necessity for such surveys. The Provincial Board of Health of Nova Scotia and the Provincial Red Cross of that province have set a good example by complying with the standards of survey suggested. Much good is to be anticipated from a concerted plan of investigation regarding the incidence and causative factors of this disease in children.

R. E. Wodehouse

THE ACTION OF HIGH ALTITUDES ON THE BLOOD

In an article appearing in the Indian Journal of Medical Research for July 1921, Dr. Hingston speaks of the physiological changes which were found to take place in the blood on ascending from a low to a high altitude when climbing the mountains of India. If the ascent is gradual, blood cells are rapidly increased in number and acclimatization is complete but if the ascent is rapid, the corpuscles fail to be developed with sufficient rapidity, and the person suffers from mountain sickness. The recent expedition to the Andes for the purpose of further physiological investigation of life at high altitudes was originally planned by the Royal Society but later on received financial support from the Rockefeller Institute, from many medical institutions in the States, from the University of Toronto, and from private individuals. One of the members of the Institute was Professor Meakins formerly of McGill University but now connected with Edinburgh University.

The Peruvian Andes were chosen for carrying out this research, not only because the Central Railway of Peru attains a height of 15,880 feet permitting easy ascent, but also possesses the advantage of having a large native population which had lived at this altitude for many generations, going back to a time before the occupation of the Spaniards and even the Incas. The town of Cerro de Pasca which is situated at a height of 14,000 feet above sea level is the third largest city in Peru, and has been the centre of a mining industry for hundreds of years. A report from the Expedition has been published recently in the British Medical Journal, April 22, 1922.

"The members of the expedition suffered from mountain sickness in varying degrees. None of them slept well; some had short hours of sleep, and others, while sleeping the allotted hours, had fitful and broken rest. At the end of a month all of them were mentally quite exhausted. It was clear, however, from the activities of the mining staff, that a fair amount of mental work could be sustained for long periods at 14,000 feet, but with regard to muscular work there were evident limitations to the effort even of the most acclimatized. In some respects it was surprising how much exercise could be taken. Dancing and lawn tennis were possible so long as the exercise took place on the flat, but on even the gentlest gradient the limitation which the low barometric pressure placed on the powers was obvious. The natives could perform some remarkable feats, even to carrying 100 pounds of ore on the back from a mine 250 feet deep, but this was only done with frequent pauses, due to the necessity of squaring the oxygen account.

The facial appearance under these conditions underwent considerable change, especially in colour. Many of the natives were sallow, but those who were ruddy had cheeks which were purplish rather than pink. One of the mining engineers had an unusually fresh complexion, but not until the party saw him at sea-level subsequently did they discover that it was pink rather than purple. The actual colour of the arterial blood bore out this observation. If taken from the radial or brachial arteries, without exposure to air, the blood appeared to be venous in character, and was, in point of fact, usually about 85 per cent. saturated with oxygen, or, as the Americans said, 15 per cent. unsaturated. The lips and nails of the visitors were obviously cyanosed on arrival, and this cyanosis, although it decreased, never entirely went away. Another interesting physical sign, which was often seen, though not present in the majority of the natives, was clubbing of the fingers, and several cases were examined in which this condition was found to be unassociated with any cardiac or pulmonary lesions such as might be suspected if the appearance was met with at sea-level. The shape of the chest, as indicated by X-Ray photographs, showed that the sternum was carried in an elevated position, and the ribs were more horizontal than in the case of normal people. This was true both of the American engineers and of the native population, but during the month of the party's stay none of the members acquired the habit of carrying the chest distended. The red blood corpuscles were found to be increased in numbers, up to between 6,000,000 and 7,000,000 in members of the party, while among the residents counts up to 8,000,000 were made, with corresponding increase in the hæmoglobin. There was also a marked rise in the reticulated red blood corpuscles observed among members of the party on arrival, and a corresponding fall subsequent to the descent. No nucleated red blood corpuscles were seen. The chemical changes in the blood were also of considerable interest, but in a general way they suggested that the blood acquired its oxygen more easily at high altitudes than at sea-level. Altogether, it was clear that life could be carried on in a comparatively satisfactory manner without the production of gross permanent disabilities, consistently with the degree of unsaturation of the blood already described, for no member of the party suffered from this stay in the heights of the Andes, and Mr. Barcroft believed that there was no suffering among the mining community, at all events during the first five decades of life."

The Association

ANNUAL MEETING, WINNIPEG,

JUNE 20-23rd, 1922

THE arrangements for the Meeting have been progressing favourably and there is every indication that the meeting will be a notable one in all respects.

In both Canadian Pacific and Union Depots, information booths are being established and visitors on arrival should go to the booth and obtain their hotel reservations and general directions. In this connection it may be stated that the Committee on Hotels are very anxious to arrange reservations early for everyone. The filling in and mailing of the post card included with the prospectus which has been mailed to every medical man in Canada, will greatly facilitate matters.

A large number of automobiles belonging to the physicians of Winnipeg have been placed at the disposal of the Local Committee for use during the meeting. These will be plainly marked and are *for the use of visitors*—USE THEM.

Many special entertainment features are being arranged and abundant facilities for golf will be available.

The sessions on Tuesday, June 20th, are for business only but many matters of extreme interest and importance to the profession at large will be discussed and a large attendance is hoped for. There will be social entertainment features for this day also.

The following constitutes the Scientific Programme:

MEDICINE

Wednesday, June 21, 9-12:30

Barker, L. F.: Address, 20 minutes.

Banting and Best: "Diabetes"; Treatment of Experimental Diabetes and Diabetes Mellitus with Pancreatic Extracts.

Cumming: "Diabetes."

Pierce, S: "Blood Cholesterol."

Thursday, June 22, 9-12:30

McPhedran, J. H.: "Psychical Conditions in General Medicine."

Russel, C. K.: "Epidemic Encephalitis and the influence of Horse serum in treatment."

McKenzie: "Functional Paraplegia," with case report.

Hunter: "Application of the new Psychology by the Internist and General Practitioner."

Burridge, A. J.: "Auricular Fibrillation."

Friday, June 23, 9-12:30

Martin, C. F.: "Observations on some Methods of Examination in Gastric Disease."

Goldie, W.: "Reasons for the Variation of Symptoms in Gastric Ulcer."

Brown Alan: "Effect of a High Protein Diet in the Treatment of Chronic Intestinal Indigestion in Children."

Young, F.: "Direct Measurement of Venous Pressure."

SURGERY

Wednesday, June 21, 9-12:30

Campbell, A. McK.: "Modern Viewpoints on Abdominal Surgery," with lantern slides.

Carman, R. D.: "The Limitations of Rœntgenologic Diagnosis"; Address.

McMecham, P. H.: "Safety-First in Anæsthesia."

Graham, R. R.: "Surgical Aspects of the Gall Bladder Problem."

Boyd, W.: "Studies in Gall Bladder Pathology."

MacKay, D. S.: "Some Observations on the Treatment of Pelvic Inflammation with Radiant Heat."

McKenty, J.: "End Results in Duodeno-jejunostromy."

Thursday, June 22, 9-12:30

Finney, J. M. T.: "End Results in Operations for Gastric and Duonenal Ulcer".

Ridson, F.: "Plastic Surgery of the Head and Neck„, wich lantern slides.

McKenzie, D. W.: Mechanical Factors in Infections of the Renal Pelvis".

Bruce, H. A.: "Hypernephromata."

Seng, M. I.: "The Prostate Problem Simplified."

Gordon, C. S.: "A new Cysto-urethroscope for examining and operating on any part of the Urinary Tract by Direct Telescope and Indirect Periscope Methods."

Cromarty, R. P.: "Some Observations in Surgery of the upper abdomen with special reference to Gall Bladder; Duodenal membranes."

Boardman, E. J.: "When to operate on Renal Calculus."

Brandson, B. J.: "Perforated Duodenal Ulcer."

Friday, June 23, 9-12:30

Aikens, H. B.: "Radium Therapy; Lantern slide demonstration."

Primrose, A.: "Tumours of the Breast; Malignant and Benign."

Bazin, A. T. and Gurd, F. B.: "Lung Abscess."

Dean, R. D.: "Coxa Plana; Diagnosis and Treatment."

Keenan, C. B.: "Plating in Compound Fractures."

Gibson, A.: "Fractures of the Oscalis."

Gardner, W. A.: "Osteo-arthritis."

GENERAL MEETINGS

Wednesday, June 21, 2-4:30

Cole, L. G.: "Roentgen Indications for Surgical Procedures in Gastric Ulcer."

Finney, J. M. T.: "Spasmodic Torticollis."

Todd, J.: "The Fruits of Medical Research."

Thursday, June 22, 2-4:30

Montgomery, E. W.: President's Address.

Barker, L. F.: Address.

Miller, J.: "Tuberculosis."

Stewart, D.: "Intestinal Tuberculosis."

Friday, June 23, 2-4:30

McGregor, J. K.: "Exophthalmic Goitre".

Howard, Campbell: "Some Phases of Dysthyroidism".

Starr, F. N. G.: "The Goitre Problem from the Patient's Standpoint."

McKechnie, R. E.: "Some thoughts on Goitre."

Riggs, W.: "Diagnosis and Treatment of Hyperthyroid Goitre."

Note: Wednesday, June 21, at 8:15 P.M.

Public Meeting to be addressed by Drs. Barker and Finney.

Lieutenant-Governor, R. G. Brett, Chairman.

The Local Committee have tried to make the meeting a genuine success but this can only be assured by a large attendance of the profession from all over Canada.

Everyone will be made welcome. Winnipeg and Western Canada generally will be at their best. It will be worth while coming.

Cerebral Embolism following arrest of Auricular Fibrillation by Quinidin.—The diagnosis in the case cited by FRANK N. WILSON and GEORGE R. HERRMANN, Ann Arbor, was cardiosclerosis with auricular fibrillation and heart failure. The patient was given two preliminary doses of quinidin sulphate, 3 grains (0.2 gm.) each, which produced no unusual symptoms. On the following day (January 21) he received three doses of 6 grains (0.4 gm.) each at four hour intervals. Aside from a conspicuous increase in heart rate, no special effects were noted. After a fourth dose of the drug on the following morning, it was found that his pulse had become regular. About eight hours later he complained of sudden numbness of the left side of the body and left extremities, and of being unable to see well objects to the left of him. Examination revealed weakness of the left arm, diminished knee jerk on the left, and left homonymous hemianopsia. He was seen by Dr. C. D. Camp, who made a diagnosis of "extrapyramidal hemiplegia due to a lesion in the neighborhood of the right optic thalamus." Up to March 1 the auricular fibrillation had not returned. The neurologic signs were still present but less conspicuous. There can be little doubt that they were the result of cerebral embolism.—Jour A. M. A., March 25, 1922.

Abstracts from Current Literature

SURGERY

The Management of Acute Cranial Injuries by the Early, Exact Determination of Intracranial Pressure, and Its Relief by Lumbar Drainage.

Jackson, Harry,: *Surg. Gynæc. and Obstet.*, April, 1922. Page 494.

In acute brain injuries the increased intracranial tension due to œdema and hæmorrhage of the brain is the important finding, and interferes with the normal absorption of the cerebrospinal fluid. The usually waited for symptoms of slow pulse, high blood pressure and stertor are due to medullary pressure and are precursors of death. The only method of sure and early diagnosis of increased intracranial pressure is the use of the spinal mercurial manometer. Dr. L. H. Landon's instrument is used and its readings are a safe and accurate record of the intracranial pressure. This by no means corresponds with the blood pressure reading and its increased reading shows hours in advance of the onset of medullary pressure symptoms. Treatment can be carried out under its control, reducing by lumbar puncture the pressure to normal or to half of the maximum reading obtained. This relieves subtentorial pressure as subtemporal decompression cannot do. The author's findings are based on one hundred cases of acute cranial injury and on experimental work on dogs. Quincke, prior to 1891, always measured the intracranial pressure when doing lumbar puncture, and found the normal to be between 90 and 100 m. m. of water. The cerebro-spinal fluid is secreted almost entirely by the choroid plexus in the ventricles and is absorbed by the arachnoidal villi along the sinuses especially the longitudinal sinus. Any swelling or œdema due to brain injury interferes with the absorption, flattens the cortex and endangers the medulla. It is well shown there is no danger in spinal puncture in acute head injuries such as occurs in brain tumour cases and lumbar puncture decompression can easily and safely be carried out once in twelve hours or less often. An increased blood pressure early in these cases is rare because of shock. The danger of lumbar puncture is nil in the horizontal posture if not more than 10 to 20 c. c. are removed slowly. Sharpe has done 1,100 lumbar punctures in the last three years without a death. Usually the blood pressure falls slightly after the spinal puncture. Thirty c. c. cerebro-spinal fluid exists in the ventricles, 60 c. c. in the cisterna, and 30 to 60 c. c. in the spinal canal. In 547 cases of autopsy of skull fracture in the Cork County Hospital, LeCount, between 1911 and 1918 found: 20% showed extra dural hæmorrhages from rupture of the middle meningeal artery: 95% of all fractures showed subdural injuries. The most frequent finding was *traumatic œdema* of the brain.

In the diagnosis of intracranial injury, the finding of blood in the cerebro-spinal fluid and of increased pressure as indicated by the manometer is of more importance than X-Ray examinations; and the usual so-called symptoms of compression of the brain as papillœdema, slow pulse, high blood pressure, etc., should not be waited for. If the pressure is high with clear fluid, we should suspect middle meningeal hæmorrhage. The author advocates repeated puncture, every 6 to 24 hours, to reduce pressure.

In 14% the spinal pressure was above 30 m. m., one case reaching 60 m. m. In 34% it was between 20 and 30 m. m., in 44% between 10 to 20 m. m. He has reduced the mortality rate from 50% to 25%. He divides his cases into four groups: (a) Very severe crushing injuries with medullary injury, dying within a few hours, or at least within 24 hours, 13.3%. Pressure readings were 12 to 60 m. m. There is no treatment of value. (b) Mild brain injury with unconsciousness, normal or slightly plus readings up to 12 m. m., with no blood. These recover in 24 to 72 hours. They comprised 26.6% of cases, none were fatal. (c) Moderately severe cases, with or without fracture, or contusion of brain. Puncture shows blood in the fluid and pressure is 12 to 22 m. m. Reflexes are altered and there is temperature elevation. Here 10 to 20 c. c. of fluid were removed. They formed 42.2% of cases, mortality 3%. (d) Very severe brain injuries; bloody fluid under pressure of over 22 m. m. They were 20% and mortality was 6%.

The animal experiments showed that the slow pulse and rise in blood pressure, etc., were due to medullary compression. Chas. K. P. Henry

The Diagnosis and Treatment of Some Common Injuries of the Shoulder Joint.

Lovett, R. W.: Surg. *Gynæc. and Obstet.* April, 1922, Vol. xxxiv, page 437.

As an introduction the writer reviews some important anatomical conditions which are found in relation to the shoulder joint. In the process of evolution the joint which is purely a hanging one, is forced to support the arm. This is accomplished, not by the capsule, but by the surrounding muscles, biceps, triceps, coracobrachialis and deltoid. Abduction of the arm depends on fixation of the scapula by means of the trapezius, rhomboids, pectoralis minor and serratus magnus. Certain muscles are very intimately related to the joint. The subscapularis merges with the front of the capsule while the infraspinatus passes across the posterior surface. The long head of the biceps passes through the joint capsule. The floor of the subacromial bursa is only separated from the capsule by the tendons of the short rotators. The pectoralis major and latissimus dorsi muscles in being more powerful than the deltoid and supraspinatus, favour an adducted position of the arm.

In many shoulder-joint injuries, so many structures are involved that it is impossible to identify any particular one. The writer considers that the diagnosis of subacromial bursitis is much too freely used, and urges the further examination in these conditions to see if a more exact descriptive diagnosis cannot be discovered. No symptom is essentially diagnostic of subacromial bursitis. Any tearing or stretching of the capsule produces limitation of abduction and rotation. Certain muscles such as the deltoid, biceps and internal rotators are commonly strained. Active contraction will be painful and the pain most likely referred to either the origin or insertion. In the case of the deltoid, passive motion in a certain direction may be allowed while the active motion is painful. If the biceps is involved, flexion of the forearm, or supination will cause pain. Tenderness and crepitus may be elicited in the bicipital groove. Pain in internal rotation may be due to injury of the pectoralis major, subscapularis or the anterior portion of the capsule. Severe reaction in the shoulder-joint associated with inability to abduct the arm, and tenderness over the tip of the shoulder may be due to a rupture of the supraspinatus insertion. If a piece of bone is pulled off the X-Ray will confirm the diagnosis. Synovitis, which is infrequent, produces first, limitation of rotation followed closely by abduction. Tenderness below and outside of the coracoid is acute.

In the treatment of injuries of the shoulder-joint, the arm should be abducted to take off the weight from the capsule and supporting muscles and to relieve pain. The abducted position prevents adhesions due to the pull of the pectoralis major and latissimus dorsi. This position is best secured by means of the platform splint of wire or plaster of Paris. It is an improvement to flex the elbow to a right angle and have the forearm in supination. It is not necessary to wear a splint at night except in very severe cases. Light massage with electric light baking should be commenced as soon as the acute stage is over. Where adhesions are already present it is wise to fix the arm to relieve the pain and then commence gradual abduction by means of a pad between the elbow and the body. Manipulation should be carried out every second day but not sufficient to cause any reaction. In cases where the supraspinatus has been torn away from the bone and where the X-Ray reveals that abduction does not replace the bone fragment, an open operation should be performed according to the method suggested by Robert Jones.

GEO. A. FLEET

UROLOGY

Focal Infection and Selective Localization of Streptococci in Pyelonephritis; Study I.

Bumpus, H. C., Jr.; and Meisser, J. G.; *Arch. Int. Med.*, March, 1921; Vol. 27, page 326.

Because of the almost constant presence of the colon bacillus in the urine of patients suffering from pyelonephritis, most investigators have concentrated their attention on this organism as the etiologic factor of the disease.

A colon bacillus bacteremia has been found in about 40% of cases following on the chill resulting from the removal of residual urine in prostatism. The close lymphatic connection between the bowels and the kidneys has led most observers to ascribe to the colon bacillus the contributory role. The attempt, however, to produce pyelonephritis experimentally in rabbits by an intravenous injection of colon bacilli obtained from human cases has not been successful.

The factor of oral sepsis has been rejected, owing to the fact that colon bacilli are rarely isolated in such foci. The work of Rosenow on the elective localization of streptococci has led the authors to carry out some work in this field. They selected a number of patients with pyelonephritis, in whom oral sepsis was present. Cultures were made from extracted teeth, and green-producing streptococci were always isolated. Similar cultures were made from removed tonsils. In the latter case, the flora were more varied, but the green-producing streptococci were always present.

The rabbits were injected intravenously with three to five c. c. of such cultures, proper control tests being carried out. The rabbits were killed after three to six days and cultures made from various body organs. Of 27 rabbits injected, 24 had lesions in the kidney, 8 in the bladder, 4 in the muscles, 3 in the stomach, 3 in the endocardium, 2 in the myocardium and 4 in the joints, the lesions outside of the urinary tract being relatively slight in each instance.

The streptococci obtained from the kidneys of rabbits with lesions following the injection of the streptococci, were submitted to a second animal passage. 11 rabbits were injected with cultures from three strains. 7 had lesions in the kidneys, 1 in the kidneys and bladder, and 1 had lesions in the bladder, 1 had slight lesions in the muscles, 1 in the stomach and 1 in the myocardium. In a third animal passage, 6 rabbits were injected with cultures from two strains; 3 developed lesions in the kidneys, none of the six showed evidence of lesions in any other organs.

The authors conclude that the marked affinity of this class of streptococci for the urinary tract is significant. That it was not accidental seemed to be proved by the fact that of 208 animals injected under the same conditions with streptococci from patients with diseases other than urinary infections, only seven developed lesions in the urinary tract. The pathological picture in all rabbits was always that of a localized infection of the kidneys.

The authors conclude from this study that pyelonephritis may often be due to focal infections harbouring streptococci which have a selective affinity for the urinary tract, and that the colon bacillus which is commonly found and generally believed to be the cause, is of secondary importance. F. S. Patch

Foci of Infection in Cases of Pyelonephritis. Study II.

Bumpus, H. C., Jr., and Meisser, J. G.; *Jour. Am. Med. Assoc.*, November 5th, 1921; Vol. 77, No. 19, pp. 1,475.

The authors in this study report further progress and give the results obtained in a series of six additional cases.

Added to the results of the six cases previously reported, 82 rabbits have been injected with strains of the green-producing streptococci obtained from the teeth, tonsils, urine and blood of patients suffering with pyelonephritis, and in 63 of the animals lesions of the kidneys were found.

Of interest is the clinical finding, that following the extraction of the suspected focus in the teeth, an acute exacerbation of the urinary symptoms usually occurred, accompanied by chills of more or less severity and a rapid rise of temperature. The authors regard these reactions as clinical manifestations of the specificity of the bacteria released from the removed focus, and believe that the increase in the severity of the disease is an indication that the right focus has been eliminated. They point out that prior to the eradication of the specific foci only colon bacilli were obtained from the urine, and that following the eradication of the foci, streptococci appeared for a time. Specimens of these mixed cultures from the urine containing both colon bacilli and streptococci were injected intravenously into 10 rabbits, and lesions of the urinary tract occurred in six animals, although when the colon bacilli alone were injected, lesions did not result. F. S. Patch

Actinomycosis of the Urinary Organs.

Cecil, H. L., and Hill, J. H.; *Jour. Am. Med. Assoc.*, February, 25th, 1922; Vol. 78, No. 8; p. 575.

This instance of infection of the genito-urinary tract is reported from the Brady Urological Institute. Ten similar cases only are found in available literature. A male, aged 35, who had a stricture of the urethra, entered hospital for repeated attacks of pain in the kidneys, accompanied by chills, fever, and pyuria without frequency or hæmaturia. Examination revealed a bi-lateral infection of the kidneys.

The cause of the infection was not at first recognized, owing to cultures not being incubated sufficiently long. The presence of a few branching filaments in direct smears of centrifugalized urine led the authors to suspect actinomycosis. A longer incubation showed the characteristic forms of actinomycosis. The actinomyotic infection was complicated by infection with another organism, Pseudomonas-pyocyanea.

All treatment to date has been of no avail, and owing to the bi-lateral infection, nephrectomy is definitely contra-indicated. F. S. Patch

MEDICINE

On The Curability of Gastric Ulcer. Diamond, J. S.; *Am. Jour. Med. Sc.*, April, 1922.

The author deals with an extremely interesting subject, which has naturally been a subject of controversy for many years. His contribution deals with fourteen cases of gastric ulcer of the lesser curvature which have been subjected to medical treatment for a period of years. He contends that the type of gastric ulcer most amenable to medical treatment is that existing on the lesser curvature. He draws attention to the fact that peptic ulcers, by virtue of their different anatomical locations, produce marked alterations in the normal physiological gastric function and have a varied train of symptoms. In this way each ulcer forms a definite clinical entity which can be differentiated and recognized.

After citing in detail his fourteen cases, he concludes that there is sufficient evidence to believe that they are healed in the generally accepted use of that term. A cure is assumed when a patient has remained free from symptoms for several years and has gained weight on a liberal diet. There are, of course, exceptions to this rule. From the etiological standpoint, it may well be maintained that no ulcer is ever curable, at all event not until the cause of the ulcer is discovered.

With reference to the surgery of gastric ulcers, he cites the following classifications of types for operative intervention:

1. Acute perforations.
2. Chronic perforating ulcers in which a communication of the lumen of the stomach with the neighbouring tissues has been made, causing a separate small gastric pouch or sac.
3. Chronically bleeding ulcers.
4. Hour-glass contractions.
5. Cases with frequent recurrence of symptoms, indicating the failure of medical means to control the symptoms. C. F. Martin

On Splenic and Hepatic Enlargement in Endocarditis. Arnett, J. H.: *Am. Jour. Med. Sc.*, April, 1922.

The author considers that subacute endocarditis is often overlooked and that splenic enlargement, as one of its diagnostic features, has been rather neglected. He concludes that the spleen is often greatly enlarged in patients who die of an acute or recurring endocarditis, and that this enlargement occurs independently of increase in the size of the liver.

Enlargement of the spleen is, of course, present with non-cardiac streptococcic infections, and in his study of 286 cases, he finds evidence that the enlargement is due rather to infection than to back pressure or infarction. He suggests that a more frequent and thorough physical examiantion of the splenic area would assist in the diagnosis of these conditions. C. F. Martin

The Late Treatment of Chorea. Irving, Geo. R. *Arch. Pediat.*, March, 1922.

In recent years there has been a decided tendency in the treatment of chorea to emphasize the importance of means other than medication. Increasing importance is attached not only to rest but to moderate exercise during convalescence as a means of minimizing the recurrence of the disease. For this reason he suggests, after dealing with 115 children, that supervised activity in the late treatment of chorea is of benefit, that no harm can come from such a course of treatment, either to the chorea itself or to any cardiac complications. He emphasizes, moreover, the importance of open air in the treatment to encourage the moral, physical and bodily improvement of the child, as well as his mental upbuilding. C. F. Martin

Bacillus Acidophilus and its Therapeutic Application. Rettger, L. F., and Cheplin, H. A.: *Arch. Int. Med.*, March, 1922.

The use of this organism in the treatment of intestinal conditions has recently excited a great deal of interest. In many ways the bacillus is indistinguishable from the B. bulgaricus; its essential difference, however, is that relating to intestinal implantation; while the B. bulgaricus is unable to live and multiply in the intestine of man, the B. acidophilus undergoes rapid development when administered by mouth, or as the result of milk, lactose or dextrin feeding. As a result, the ordinary intestinal bacteria are greatly diminished in number.

The authors have shown that the flora may be entirely changed within four or six days by the daily administration of 300 c. c. of pure wheybroth cultures of the organism; in fact, the B acidophilus was often present in the fæces to the extent of 90 per cent. of the cultivable bacteria. Similar results were obtained when 150 c. c. of the culture and 150 gm. of milk sugar were given in place of the requisite amount of culture alone.

In experiments upon patients with a long history of intestinal disturbances, the predominance of the organism to the extent of at least 80 per cent. of the total flora of the fæces, was brought about at will. With the co-operation of practising physicians, they soon discovered that the acidophilus milk was much to be preferred to lactose broth or whey-broth cultures of the organism, and it was much more easily tolerated.

The bacillus does not elaborate toxic or other harmful products. The authors regard the viable cultures of the germ as of particular importance in the treatment of chronic constipation and diarrhœa. Furthermore, it was regarded as of distinct benefit in the treatment of any ailment in which the function of the digestive system is disturbed, more especially the intestine. It is, of course, not a cure for all kinds of ailments, nor is it an elixir of life, as at one time Metchnikoff's B. bulgaricus was regarded. There is no use in employing acidophilus tablets and powders, for the pure cultures must be used in a proper manner. Experiments are under way for the preparation of B. acidophilus milk which will be available under conditions ensuring its viability and purity. C. F. Martin

Renal Glycosuria. Lewis, D. S.: *Arch. Int. Med.*, April, 1922.

The author draws attention to the four cardinal points in the diagnosis of this anomaly:

1. The presence of glycosuria without hyperglycemia.
2. Little, if any, relationship between the carbohydrate intake and the amount of glucose excreted in the urine.
3. The absence of the signs and symptoms characteristic of diabetes mellitus.
4. The non-development of diabetes itself after a long period of observation.

It is this last feature especially upon which particular stress should be laid in determining the diagnosis.

Three cases have been studied in detail, one of which had been observed for a period of six years. This patient still presents a marked glycosuria without symptoms and presents a normal amount of sugar in the blood; he is apparently in excellent health.

In the second patient, one with chronic diffuse nephritis, the glycosuria appeared while under observation, and was entirely independent of any of the ordinary signs of or tests for diabetes.

In the third patient, one with arteriosclerotic kidney, the glycosuria was observed at the first examination, while the date of origin is unknown. It had been observed for fifteen months. Like the other two patients, there were no signs of diabetes mellitus.

The writer refers in conclusion to the two types of renal glycosuria the one of unknown origin with a normal blood sugar curve, the other associated with a chronic nephritis in which there is a remarkably high and prolonged rise in the blood sugar, which is evidently a retention phenomenon. C. F. Martin

Post-Operative Lung Lesions. Cutler, E. C., and Hunt, A. M.: *Arch. of Int. Med.*, April, 1922.

This is the third of a series of articles on this subject by the same authors. They deal at some length with the complications that arise from various causes and bring forward statistical evidence, clinical investigations and pathological reports in support of their theories.

For the most part the anæsthetists and the anæsthesia are exonerated from blame; these complications are mainly due to embolism from the operative field; with resulting infarctions or fatal embolism. The causes of these infarctions are either trauma, mobility of the part, or sepsis, and the prognosis is usually good.

Inhalation anæsthesia, with resulting irritation and aspiration, causes but a small percentage of complications, and these are usually of the nature of a bronchitis or pneumonia.

Statistics show, too, that the same relative proportion of complications occur where local anæsthesia is used, thus demonstrating that the anæsthetist or general anæsthetic is not responsible as a rule. The prevention of complications may be helped by reducing the trauma at operation; by accurate hæmostasis; the control of sepsis, and due regard and caution in operating upon patients who have demonstrable pulmonary disease. C. F. Martin

Calcium in Heart Therapy. Singer, G.; *Therapeut. Halbmonatshefte*, 1921, Hft, 21.

Calcium therapy has been somewhat in vogue in cardiac insufficiency and decomposition, more often in combination with digitalis. Repeated small doses of calcium chloride or calcium lactate by mouth, or the calcium chloride combined with an infusion of digitalis, seems to have a favourable action. The use of Novasurol, one of the newer combinations of calcium and digitalis, is recommended by the author in the severer forms of decompensation. It is especially commended in the severest forms of stasis, either with or without hypertension. For that reason it is recommended in the cardio-renal syndromes. The introduction of calcium not only excites diuresis and more readily stimulates the action of the digitalis, but at the same time counteracts the associated effect on the vagus and the gastro-intestinal canal. C. F. Martin

On the Effect of Intravenous Glucose Injections on Heart Function and Diuresis.

Isaac, S.: *Therapeut. Halbmonatshefte*, 1921 Hft, 22.

The action of hypertonic sugar solutions, (in so far as it is present at all), rests upon the osmotic influences produced, not on the sugar content itself. An advantage exists here, in that, after the osmotic effect is produced, the sugar is burnt. Many patients feel subjectively much better after the injections. In cardiac insufficiency the injections do not bring about any essential improvement in the circulatory weakness. Localized œdemas may, however, be favourably influenced by the injection of highly concentrated sugar solutions up to 50 per cent. C. F. Martin

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Allergy in Infants and Children.—A review, together with a considerable amount of experimental work, is given by Schloss (Cornell Univ. Med. Bull., July, 1921) on the subject of allergy in children. For testing the susceptibility of the patient he prefers to employ the cutaneous test rather than the intracutaneous injection of the foreign substance. His objections to the latter are that it is not infrequently followed by infection, owing to the difficulty in obtaining sterility of the protein extracts, that it may give rise to a severe general reaction, and that it is often complicated by pseudo-reactions which add to the difficulty in interpreting the results. An important point to be observed in making the test is to assure oneself that none of the particular protein to be tested has been taken in the food during the preceding few weeks, as a period of temporary desensitization lasting from twenty-seven to forty-five days may follow such ingestion. He finds a close similarity between food allergy and anaphylaxis; for instance, he has been able to sensitize guinea pigs passively by injection of the patient's blood serum. The sensitization in children appears in some cases to be a congenital one, in others acquired. With regard to the clinical types of allergy he shows that many conditions in children— such as bronchial asthma, urticaria, angioneurotic œdema, erythema multiforme, eczema, acute dermatitis, and certain cyclic disturbances—may sometimes be referred to a hypersensitivity to one or more varieties of foreign protein. Treatment may be carried out (1) by eliminating the offending substance from the diet; (2) by hypodermic injection of the protein to which the patient is sensitive; or (3) by actively immunizing the patient by feeding. According to Schloss, in either of the two latter cases the progress of desensitization should be controlled by means of the cutaneous reaction. Brit. Med. Jour., December 10, 1921.

Danger from Automobile Exhaust Gases.—At the suggestion of the Surgeon General of the United States Public Health Service, the State Commissioner of Health has issued a warning regarding the danger to health and life from the inhalation of exhaust gases from automobiles. The effect of these gases is produced very quickly, usually before the victim realizes the danger. The following precautions should be observed in all garages: (1) Always open the garage door before starting the engine. (2) Do not allow the engine to run for any length of time in a closed garage. (3) Do not work near the exhaust of a running automobile engine. (4) Special precautions as to ventilation are necessary when in garage pits. (5) When the exhaust is used for heating a closed car the system must be free from leaks.

News Items

NOVA SCOTIA

SUMMARY OF RECENT VISIT OF DR. McMILLAN TO HALIFAX, N. S.

Oldest living Graduate of Dalhousie Medical College visits Halifax Health Centre. Dr. Finlay McMillan graduated in Medicine from Dalhousie University in 1872 and has been in active general practice ever since. He is now in his 80th year, but was very much interested in the work of the Halifax Health Centre.

In a rather extended notice of his visit in one of the city papers, the Reporter writes as follows regarding his appearance: "Of an erect, almost military carriage, slight wiry boyish figure, and vibrant personality, Dr. McMillan, seen at the Health Centre by an Evening Echo Reporter yesterday, looked to be in the prime of life, yet he was seventy-nine on Christmas Day and graduated from the Dalhousie Medical College fifty years ago. He is still in active practice which has kept him busy ever since he graduated."

The Cumberland County Medical Society which has been dormant since 1913 was re-organized at Amherst on May 3rd, 1922. Officers were elected as follows: President, Dr. D. MacIntosh, Pugwash, N. S.; Vice-President, Dr. W. Rockwell, River Hebert; 2nd Vice-President, Dr. Wardrope, Springhill; 3rd Vice-President, Dr. MacKenzie, Parrsboro; Secretary-Treasurer, Dr. W. T. Purdy, Amherst, N. S.

It was furthermore decided that the Society should affiliate with the Provincial Organization and Doctors J. Munroe and A. E. MacIntosh represent the Society on the Executive of the Medical Society of Nova Scotia. After the Meeting, the out of town doctors were entertained by the local doctors, at a supper.

QUEBEC

THE PROVINCE OF QUEBEC MEDICAL ASSOCIATION

The inaugural meeting of the Province of Quebec Medical Association took place on May 11th and 12th, 1922, in Montreal, thereby bringing together over two hundred of the members of the French and English-speaking profession on a common ground for the advancement of the Art and Science of Medicine in the Province. It was an event of no ordinary importance and the enthusiasm with which the project was received leaves no doubt as to its permanent success.

During the two days' session, clinics and demonstrations were held in the Royal Victoria Hospital, the Hôtel-Dieu, the Notre Dame and Montreal General Hospitals.

The acting President of the Association was Dr. S. Grondin of Quebec, who officially opened the sessions on the first morning in the large theatre of the Royal Victoria Hospital. After the few introductory remarks, the members of the Staff of the Hospital presented clinical cases and exhibits, followed in two hours by a visit of the members of the Association to the various clinics and laboratories of the Hospital, where special demonstrations were held and matters of interest were discussed. Luncheon was served in the staff dining room of the Hospital, about two hundred sitting down to a light collation.

The Hôtel-Dieu was next visited, where a similar programme was carried out. At 4.30 p. m. Father Molinier, representing the American College of Surgeons, gave an address on "Hospital Standardization", which was followed by some remarks from Dr. Malcolm McEachern of Vancouver, B. C.

In the evening the Presidential Address was given by Dr. Grondin. In the course of his remarks, he outlined briefly the history of clinical teaching and drew attention to the developments which had taken place since the University of Leyden held its first clinic in the 16th century. The officers and executive committee were then elected, after which Dr. Simard of Quebec brought forward the question of the Workmen's Compensation Act in its relation to practitioners. After the meeting, the members adjourned to a smoking concert, which was largely attended, an excellent programme being provided.

The second day of the Congress was opened at the Notre Dame Hospital, where the members of the Staff again presented cases and where the visitors were given an opportunity to see the work of the institution in the wards and laboratories. The members then adjourned to the Cercle Universitaire for luncheon as guests of the Notre Dame Hospital Staff.

In the afternoon the theatre of the Montreal General Hospital was the scene of a demonstration by the Staff of cases of general interest, followed by further demonstrations in the wards and laboratories of the institution.

The evening was devoted to a session of the Provincial Branch of the American College of Surgeons.

All in all, the meeting undoubtedly augurs well for the members of the profession in the Province of Quebec, and the entente cordiale for the future is better than it has been for many years. By thus linking together the members of the French-and English-speaking profession, it is felt that their mutual interests will be greatly augmented both in a personal and public way, and that their combined action may not only be of scientific value but may stimulate interest on the part of the Government in the affairs that concern the medical men of the Province.

The officers for the coming year are as follows:—President, Dr. S. Grondin, Quebec; Vice-Presidents, Dr. L. de L. Harwood, Dr. W. G. Reilly, Dr. C. F. Martin; Secretaries, Dr. Grant Campbell, Dr. J. U. Gariepy; Treasurer, Dr. E. E. Trottier; Executive Committee, Dr. P. C. Daigneault, Quebec; Dr. P. Z. Rheaume, Dr. Raoul Masson, Dr. St. Jacques, Dr. A. F. Mercier, Dr. Rousseau, Dean of Laval University, Quebec; Dr. F. G. Finley, Dean of the Faculty of Medicine McGill; Dr. J. Alex. Hutchison, Dr. W. W. Chipman, Dr. L. Leclerc, Quebec; Dr. L. P. Normand, Three Rivers; Dr. Gordon Hume, Sherbrooke.

The President and Secretary of each Medical Society in the Province, is *ex officio* a member of the General Committee.

Programme, Royal Victoria Hospital, May 11th, 1922, 10 a. m.

Adherent Pericardium with Cor Bovinum—Cases of Gastroenterostomy—Geo. E. Armstrong.

Cases illustrating the palliative treatment of incurable cancer of the tongue and fauces—Traumatic Stricture of the Aesophagus—A. E. Garrow.

New Treatment of non union of old fracture of neck of femur (slides)—W. G. Turner.

Demonstration of New Ether Mask—W. B. Howell.

Clinical observation on Ruptured Heart with specimen—Intussusception with Specimen—C. F. Martin and Dr. Waugh.

Protein reactions in Bronchial Asthma—A. T. Henderson.

Encephalitis with illustrative cases—Cerebro Spinal lues. Diagnostic points and treatment—C. Russel.

Heart Block due to Digitalis—C. F. Moffatt

Report on Experimental evidence of adrenalin in the blood of exophthalmic goitre patients—F. A. C. Scrimger.

Oedema of the feet, result of functional paralysis—Septic Arthritis as Sciatica—C. B. Keenan.

Septic Knee, Wilm's Method of treatment—F. E. McKenty.

Ureteral Calculus—Suprapubic Prostatectomy—Urological Cases—Lantern Demonstration—D. W. McKenzie.

Infant Feeding and cases of Rickets—Pneumonia—Tuberculosis and Chronic Intestinal Indigestion—F. M. Fry, Dr. Williams and Dr. Stewart.

Metabolism, Ward S. Cases of Diabetes and Nephritis—E. H. Mason.

Ophthalmological Cases—W. G. M. Byers, F. J Tooke, J. A. McMillan.

Post Operative Mastoids—B. Ballon.

Two cases of Coloboma of the Iris in the same family J. Rosenbaum.

Retro-pharyngeal Abscess—Stricture of the Aesophagus—Carcinoma of Vocal Cord removed through Laryngofissure—Gumma of Nasal Septum—X-Ray plates of Sinuses and Mastoids—J. T. Rogers.

Operative Case. Repair of complete perineal laceration—W. W. Chipman

Tuberculosis and pregnancy—Ovarian Cystoma—Fibroid with gangrenous prolapse from Vulva—H. C. Burgess.

Intestinal tuberculosis—E. W. Archibald

The electrocardiograph demonstration of its uses—Normal tracings—The principal abnormal tracings—C. F. Moffatt.

Pathological Specimens—H. Oertel, C. T. Crowdy and Dr. Waugh.

X-Ray demonstrations of interesting Stomach Cases by viewing boxes and fluoroscopically—A. H. Pirie and H. H. Cheney.

Lunch at 1 o'clock in Staff Dining Room.

Hotel-Dieu, jeudi 11 mai 1922, a 2 heures p. m.

Hémoclasie digestive pour fonctions protéopeptique et glycogénique—Dr. Gauthier.

Syndrome d'Addison et surrénalite hyperplasique en rapport avec tuberculose pulmonaire et intestinale—Dr. Latreille.

Progrès en radiologie—L. Pariseau.

Cancer du rectum, diagnostic différ procédé opératoire—E. St. Jacques.

Néphrite chronique, diagnostic et traitement—Présentation de malade—Dr. Dubé.

Oto-rhino-laryngologie. Présentation de malades.—Dr. Lassalle.

Rein unique; calcul urétéral—D. A. Hingston.

Vaccinothérapie dans un cas de fièvre puerpérale—Un cas de cholécystectomie—A. Saint-Pierre.

Anus contre nature: considérations—Suture du sciatique, résultat éloigné—Dr. Rhéaume.

Hopital Notre Dame Seance du 12 mai.

(a) Technique opératoire dans les suppurations pelviennes, (cloisonnement du bassin)—(b) Examen d'une malade—L. de L. Harwood.

Un cas de myxœdème—E. P. Benoit.

Fractures de la colonne vertébrale avec illustrations—O. F. Mercier.

Un cas d'arythmie perpétuelle—Albert Lesage.

(a) Tuberculose rénale (malade et pièce anatomique)—(b) Hémimélie (membre inférieur); Radiographie; Pièce—T. Parizeau.

Quelques observations sur le diabète—A. Léger.

Quelques cas de pieds bots—B. G. Bourgeois.

Un cas de maladie de peau—Tuberculose cutanée.—Gustave Archambault.

Fracture comminutive ouverte du 1-3 supérieur de l'humérus droit, avec paralysie du radial. Résultats éloignés; Présentation du blessé—Léonidas Blagdon.

Ponction lombaire—Noé Fourneir.

Exposition de plaques radiographiques au département des Rayons X—J. E. Panneton.

Montreal General Hospital May 12th, 1922, 2-4 p. m.

Splenomedullary Leukaemia—H. A. Lafleur.

Heart Block—A. A. Robertson.

Banti's Disease—C. A. Peters.

Femoral Thrombosis and Pulmonary Embolism—J. A. Hutchison.

Pneumopericardium—A. T. Bazin.

Fracture of Sacrum—Fracture of Great Trochanter—F. J. Tees.

Treatment of Infected Open Pneumothorax—F. B. Gurd.

Carcinoma of Lip—W. L. Barlow.

Recent Methods of Intracranial Diagnosis—C. K. P. Henry.

Tuberculous Infection of Foot—A. R. Pennoyer.

Acidosis—M. Rabinovitch.

1. Vaginal Hysterectomy: (a) Adenoma-Carcinoma of body; (b) Polypoid Endometritis (specimen)—H. M. Little.

2. Interposition Operation for Prolapse—H. M. Little.

The Bronchoscopic Treatment of Pulmonary Abscess—R. P. Wright.

The Surgical Treatment of Paralytic Club Foot—J. A. Nutter.

Osteo-myelitis and General Septicaemia—A. M. Forbes.

Eye Symptoms in Graves' Disease—S. H. McKee.

Papilloma of Renal Pelvis—F. S. Patch.

X-Ray Demonstration—W. A. Wilkins.

Thyroidectomy under Local Anaesthesia—E. M. Eberts.

Lantern Demonstration of Skin Diseases—G. G Campbell.

Demonstration of Fracture Cases—F. J. Tees and F. B. Gurd.

Inspection of Pathological Laboratories—L. J. Rhea.

ONTARIO

THE CHIROPRACTIC BILL THROWN OUT.—No better demonstration of what organized effort can do, will ever be shown, than is evident in the fate of this Bill brought before the Private Bills Committee on April 11th. In this connection, the efforts of the President, Dr. Farley, the Secretary, Dr. T. C. Routley, and of Dr. E. E. King, Chairman of the Joint Advisory Committee, must be especially commended, for, if this Bill had gone through, it can be safely said that Chiropractic would have been landed on a firm footing in the Province. The Bill as read was "an Act to incorporate the Canadian College of Chiropractic, Limited; to establish, and maintain the necessary place and equipment for the purpose of carrying on a College, branch colleges, publishing text books, giving lectures and concerts and moving picture exhibitions, and the granting of diplomas; and, furthermore, to establish, maintain, and conduct sanataria and hospitals in connection with the said college, for the practice of Chiropractic and for the conducting of clinics, public and private."

It can be pointed out that, if the Government grants permission to the Chiropractors to establish hospitals and sanataria, it is but a short step to permitting them to enter and practice in the various hospitals and sanataria at present established; and, secondly, that, if this charter were granted, it legalizes the practice of Chiropractic in the province. The profession was represented by a large delegation representing the various universities and provincial organizations.

The thanks of the profession are owing to Dr. Forbes Godfrey and other members of the House for their adroit questioning of Dr. DuVal who was present as representing the Chiropractors. As a result of their inquisitions, the impropriety of the Chiropractic claims was made only too evident, and the members of the Private Bills Committee in throwing out the Bill informed the Attorney General that further information from the physicians representing the medical profession was quite unnecessary.

THE Medical Society of Port Arthur met on April 1st. Dr. Geo. Strathy, of Toronto, gave a lecture at 2:00 p. m. on "Pain in the Back," and at 9:00 p. m. on "Arteriosclerosis. In the morning Dr. Strathy gave clinics at McKellar Hospital, and there were clinics at St. Josephs and Port Arthur General Hospital in the afternoon.

THE Western Ontario Academy of Medicine met on Tuesday, April 18th, in the Medical School Auditorium. Addresses were given by Dr. John Oille, of Toronto, on "High Blood Pressure and Arteriosclerosis"; by Dr. Anthony Bassler, of New York, on "Splanchnoptosis," and the programme closed with a gastro-enterological clinic.

GENERAL

SPECIAL

BY an unfortunate oversight two well written obituaries, one upon Dr. George Bingham and the other upon Dr. George Elliott in the April issue, appeared without the initials of the contributors. By special request, Dr. H. B. Anderson, of Toronto, had undertaken that of Dr. Bingham and the style and diction thereof show well the intimate knowledge the writer had of the life he was handling and the care he had taken to produce an appealing personal description of Dr. Bingham.

Dr. J. N. E. Brown, of Toronto, contributed the very delightful sketch of Dr. Elliott to one of the Academy evenings in Toronto and we are indebted to him for the permission to reproduce it. The Journal apologizes to Dr. Anderson and to Dr. Brown for the omission.

Obituary

DR. FREDERICK A. RAND

DR. FREDERICK A. RAND, of Parrsboro, N. S., died at his home, April 25th, 1921, of heart failure, following over-exertion. He was born in Canning, N. S., in 1855. He studied medicine at Dalhousie Medical College and the University of New York. He was a leading citizen, and for six years was the town's Chief Magistrate. He was Coroner for that section of the county for 30 years. He has in recent years attended to his private business and has not been in active practice.

JOHN MOODY BINGAY

DR. JOHN MOODY BINGAY, one of the oldest medical practitioners in the Maritime Provinces, died at the home of his son in Glace Bay, on Friday, March 31st, 1922.

Dr. Bingay was born at Tusket, Yarmouth Co., on November 30th, 1836. In his early youth he removed to St. John, N. B., where he spent several years, including that of the great cholera epidemic of 1854. In 1860 he entered Harvard University from which he graduated in 1862 having by his industry, and hard work completed a course in two years, which usually required three. After graduation, Dr. Bingay returned to his native land, and settled in Tusket where, and in the surrounding districts, he practised his profession for fifty years, retiring in 1912.

A quotation from a Yarmouth paper at the time of his death indicates the esteem in which he was held: "In his profession he was most thorough in all things, and as a physician he was very widely known to many persons throughout western Nova Scotia. Dr. Bingay possessed a very benevolent disposition, and his kindly attention to many patients, particularly those of straightened or adverse circumstances, will hold him in loving memory for many years to come."

DR. GEORGE BINGHAM

DR. GEORGE SHELDON BINGHAM died on April 6th, in Hamilton, in his seventy-first year. He was a native of Kitchener, the son of Dr. G. W. Bingham and Mary H. Bingham. He graduated in 1881, from Victoria University, practised first in Waterloo, and for the last forty years in Hamilton.

DR. ALBERT KINZEY, who had been practising at Hearst, Ontario, died at Gravenhurst on April, the twenty-ninth, aged thirty-five years.

Book Reviews

International Clinics. Thirty-first series, vol. IV, 1921. Edited by H. R. M. Landis, M.D., Philadelphia, U. S. A., with Medical and Surgical Collaborators in United States, England and Canada. J. B. Lippincott Company, Montreal, Que. Price, $2.50 per volume or $10.00 for the series of four.

The final volume of this series completes a most excellent year's presentation of papers in the various departments of medicine and surgery. The papers in industrial medicine continue to be of outstanding merit. In addition to practical suggestions in the treatment of fractures and of stiff joints, there is a splendid article on "Workman's Backache." The surgical papers on the large bowel and pelvic surgery are well written and have excellent illustrations. Babcock's paper on the management of dyspnea of circulatory origin is an outstanding contribution among several medical papers of great interest and clinical value. The volume closes with a good article on the cœfficient of safety in general anæsthesia.
J. H. E.

Exophthalmic Goitre. Walter Edmunds, M.A. M.Ch., F.R.C.S., London. Demy 8vo, 36 pages, 4 plates. London, Bailliere, Tindall and Cox, 1921. Price, 3/6.

This small volume is a reprint of a lecture delivered at the North-East London Post-Graduate College in April 1921. It is a short sketch, historical, anatomical and philosophical; pleasant reading, but not a practical treatise. It is thought provoking rather than conclusive
J. H. E

Medical and Surgical Reports of the Episcopal Hospital. Volume V.—Edited by Astley P. C. Ashhurst, M.D. 498 pages, 162 illustrations. Philadelphia, Press of Wm. J. Doran, 1920.

This volume of reports contains contributions by members of the staff based upon work done in the hospital during the years 1916-1920. The publication has been made possible through the establishment of a special fund by a generous friend of the hospital. The editor is to be congratulated upon his work. The pages are well written and the illustrations excellent. Drawings, photographs and radiograms are all well reproduced. Many of the articles have appeared in journals and are reprinted, others have not been published previously. The quality of the work done in a hospital cannot but be influenced by the development of care and enthusiasm stimulated by such a volume of reports.
J. H. E.

Protein Therapy and Non-Specific Resistance—William F. Petersen, M.D., Associate in Pathology, University of Illinois. With an introduction by Joseph L. Miller, M.D., Professor of Medicine, Rush Medical College. 314 pages, vol. XVII. New York, 1922. The McMillan Company. Price, $1.50.

In all times and in all lands physicians have sought an explanation for the observed fact that some individuals are resistant to infectious disease and some are not, that with the same infection one man may recover and another may die. With the discovery of the relation of bacteria to disease the trend of thought was along the lines of specific bodies and specific resistance. This particularly followed the brilliant work of Von Behring and Roux. We have been inclined to mark the progress of therapy during the past thirty years by the measure of success achieved in the production of specific immunizing agents. For the past seven years, however, there has been a growing literature on the subject of the non-specific character of vaccine therapy and other forms of protein therapy.

Clinical reports are numerous on the results of treatment of disease by non-specific agents which may give either general reaction, or focal reaction in the disease area, or both general and focal reaction. The author who for a number of years has been studying the process of immunity, has brought together the clinical results so far reported. He makes little attempt to criticise or evaluate, but rather to tabulate. For example, under carcinoma he notes the reports of the use of serum albumin, ovalbumin, convalescent serum, normal horse serum, milk intramuscularly, trypsin, tumour autolysates and other substances. Their use is followed by a period of malaise and fever for several days and then for a time a general improvement in the condition of the patient, with gain in weight, better appetite, lessened pain, and at times decided regressive changes in the tumour.

The theories of the mechanism of the reaction of the body tissues to foreign protein are discussed and all the diseases to which such treatment has been applied are considered.

The author is not prepared to state definitely that he believes that non-specific resistance and non-specific immunity are of greater importance to the organism than are the specific forces. He retains an open mind. No conclusions are reached though it is evident that the evidence presented has influenced the author to believe there is a future for non-specific therapy. His bibliography contains some eleven hundred titles arranged alphabetically by authors.
J. H. E.

How to be Useful and Happy from Sixty to Ninety—A. Lapthorn Smith, B.A., M.D., M.R.C.S., with a foreword by Sir Charters Symonds, M.D., M.S., F.R.C.S., K.B.E., C.B. Publishers, John Lane, the Bodley Head, Limited, London, 1922. Octavo, cloth, 5 shillings.

No good Canadian should die without having perused this volume; and, to be Irish, he probably won't die if he does. Anyone who can remember the author and the many long illnesses through which he went, and the acute collapse which looked to be the end of his life, can only marvel at the resurrection which this book seems to indicate. Dr. Smith's early life in Montreal, a life full of activities, an active existence in the west, a complete uprooting at the time of the war and a transplanting into army life and English civil practice would seem to mean that his life demonstrates the possibility of applying the principles set forth so interestingly in his book. To have produced at his age such a readable volume is an example to one and all of us and the publication is assured already of popular favour.
N. G. B

Annual Report of the Surgeon General of the Public Health Service of the United States for the fiscal year 1921.—Treasury Department, A. W. Mellon, Secretary. Washington, Government Printing Office. Quarto, 425 pages.

An interesting review of the many problems which are occupying the public health service of the United States. Such things as malaria control, investigations into the cause of pellagra, botulism, leprosy, anthrax, hookworm disease, plague, are all considered from a public service standpoint. Child Hygiene, industrial medicine, is reviewed. Questions of quarantine, destruction of rodents are given interesting chapters. It is interesting to note that in the lead industries, fifteen per cent. of the workers show poisoning to a greater or less degree. A large section of the book is given up to the division of Marine Hospitals and relief.
N. G. B

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Books Received

Tuberculosis in Infancy and Childhood—Lectures delivered at the Children's Hospital, Philadelphia, under the auspices of the Philadelphia Pediatric Society. By J. Claxton Gittings, M.D., Frank Crozer Knowles, M.D., and Astley P. C. Ashurst M.D., with 23 illustrations. Published by J. B. Lippincott Co., 201 Unity Bldg., Montreal. Price, $5.00.

The Surgical Treatment of Non-Malignant Affections of the Stomach—By Charles Greene Cumston, M.D., and Georges Patry, M.D., with an introduction by Sir Berkeley G. A. Moynihan, K.C.M.G., G.B., M.S. Published by J. B. Lippincott Company, 201 Unity Bldg., Montreal. Price, $5.00.

Practical Infant Feeding—By Lewis Webb Hill, M.D. Octavo of 483 pages, illustrated. W. B. Saunders Co., Philadelphia and London and J. F. Hartz Co., Limited, Toronto. Price, $5.50.

L'Hypertension Arterielle—By Maurice Perrin, M.D., and Gabriel Richard, M.D. Published by J. B. Bailliere and Sons, 19 Rue Hautefeuille, Paris, 1922.

The Intensive Treatment of Syphilis and Locomotor Ataxia by Aachen Methods (with notes on Salvarsan).—By Reginald Hayes, M.R.C.S., fourth edition, revised; 99 pages, 4 plates, price, 4/6. Published by Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden, London, 1922.

Surgical and Mechanical Treatment of Peripheral Nerves—By Byron Stookey, A.M., M.D., with a chapter on Nerve Degeneration and Regeneration, by G. Carl Huber, M.D., 270 illustrations, eight in colour, and 20 charts. Price, $10.50. Published by W. B. Saunders Company, Philadelphia. J. F. Hartz Co., Ltd., Toronto, Canadian agents.

A Form of Record for Hospital Social Work, including suggestions on organization.—By Gertrude L. Farmer. 81 pages. Price, $1.50. Published by J. B. Lippincott Company, 201 Unity Bldg, Montreal.

Artificial Limbs and Amputation Stumps—A practical handbook, by E. Muirhead Little, F.R.C.S. (Eng.) with 267 illustrations, 319 pages, price 18 shillings net. Published by H. K. Lewis and Co., Ltd., 28 Gower Place, London, W. C.

Pneumothorax caused by Foreign Body Swallowed.—A. F., age 14 on Aug. 7, 1921, accidently swallowed a Canadian cent. When seen about six hours later, he swallowed freely water and food, and made no complaint. Forty-eight hours later he complained of some diffuse pains in his chest and an X-ray examination showed that the coin was lodged in the oesophagus at the diaphragmatic level. Under anaesthesia an unsuccessful attempt was made to extract it, and it was believed that the coin had been shoved into the stomach. The following afternoon temperature and respiration were elevated and the patient appeared anxious and very worried. The following day some fine crepitations appeared at the right base and twenty-four hours later a right-sided pneumothorax was definitely made out. After several days a large aspirating needle was put into the right thorax and turbid fluid was withdrawn with particles of what appeared to be orange shreds and all having the odor of buttermilk. Laboratory examination showed lactic acid and no HCL. Conclusion was that the oesophagus communicated with the right pleural cavity. Under local anaesthesia a tube was inserted into the right pleural cavity and a considerable amount of the same material escaped. Food, etc., continued to drain from the tube. He continued ill for a month and on September 8, he passed the coin per rectum. On two occasions up to that time, fluoroscopic examination showed the coin to be still in the oesophagus and showed the results on the left chest, of the right-sided pneumothorax. From the passing of the coin improvement began and in three weeks food discontinued to appear in the drainage and the lung came down to the level of the 3rd rib in front and breath sounds began to appear again. On Nov. 1, he was discharged from the hospital still wearing the tube and showing some flattening of the right chest. The communication between the oesophagus and the pleural cavity has remained closed. The chest now shows a marked degree of flattening on the right side. Beyond the fact that the right thorax is still draining and he wears a tube, he feels normal.—F. R. Clegg, M.D.

Deterioration of Non-Arsphenamin.—Commercial neo-arsphenamin, GEORGE B. ROTH, Cleveland (Journal A. M. A., April 22, 1922), states is a relatively unstable substance in the ampule. Temperature is a potent factor in causing its deterioration. It is advisable to keep it under storage conditions similar to those required for vaccines, that is, at icebox temperatures, until all the factors concerned in causing the deterioration of the compound are understood.

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ADDRESS OF THE PRESIDENT OF THE ONTARIO MEDICAL ASSOCIATION*

F. J. Farley, M.D.

Trenton

To be President of the Ontario Medical Association is indeed an honour, a privilege and a pleasure. To divest one's self at the end of the year of a presidential address to a gathering such as this is a privilege and an honour, but I cannot truthfully say a great pleasure. However, I feel it my duty to present to you at this time some racy remarks, opinions and observations. I, therefore, crave, not claim, your kind indulgence.

The activities of the O. M. A. have become so changed, so enlarged and so greatly broadened during the past few short years that the organization has become entirely reborn. Owing in a large measure to the untiring efforts of my predecessors in office, the Association has taken on a scope and aspect so provincial-wide in its application that its membership, its work, and, in truth, its very thought have become symbolic, we believe, of the best in medicine in Ontario to-day.

As no structure is stronger than its foundation, and as the county and affiliated societies are the foundation stones of our association, I wish to say a few words about the work which is being done by our local units. Our secretary reports that, during the year, five new county societies have been organized, bringing the total number of active societies in the province up to 40. The reports from all are very encouraging, showing that they are quite active and fully alive to the benefits to be derived from thorough organized effort. Our central office, presided over by our secretary, Dr. T. C. Routley, affords a clearing house for all of our problems, and a survey of the correspondence handled therein during the past year is most indicative of the constant proximity of our local units to the provincial organization.

As is known to most of you, the province is divided into ten counsellor districts, each district comprising several counties and being presided over by a counsellor whose duty it is to represent that district on the board of directors, and to assist in every possible manner in the work of the respective counties under his jurisdiction. During the year, as your president it has been my esteemed privilege to visit most of the districts, and I must say that I regretted being unable to visit them all. Commencing with the district meeting at Burk's Falls last August, and, later, the meetings at Port Arthur, Windsor, Peterboro, Owen Sound, Kingston and Toronto, a fair proportion of the province was covered. All of the district meetings were well attended, splendid papers being presented, in some places clinics being given, and there was uniformly in evidence a feeling of good fellowship and an *esprit de corp* which I cannot too strongly emphasize as the strong link in the chain which will bind medical men together, in honour preferring one another. I cannot pass from this reference to our district meetings without making particular note of the wonderful hospitality and good fellowship exhibited wherever we went. No place more than in our northern country was this in evidence and, as already intimated, I am strongly of the opinion that the social side of these district and county society meetings must rank very closely in value with the scientific and instructive phases. I would most heartily recommend the in-coming president to follow up this line of work; to urge all districts to stage meetings, and every physician to attend in person the district meetings, where, I am sure, he will find much profit and pleasure, and will have the added advantage of bringing himself into direct touch with a great many members of the association.

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*May 31st, 1922.

In addition to the nine district meetings which were held, and at which 57 speakers participated, the central office reports having arranged for 172 speakers to visit our county and affiliated societies during the past year. The question might here be asked, How was this extensive program financed? Just at this point let me say that, if in Ontario during the past year, there has been staged the most comprehensive medical extension course which has yet been put on in this or any other country, we have, in a large measure, to thank the Ontario division of the Canadian Red Cross for the splendid donation of $5,000 which, in a large measure, contributed to our program. Upon receipt of this magnificent grant, it was decided that the speakers would be paid their travelling expenses plus a nominal fee of $10.00 for their visitation at a county society meeting; and it was further decided that this arrangement would apply to each of our affiliated societies up to the limit of six speakers during the association year. Of course, the president has the privilege of paying his own expenses, while the association provides for the secretary. The 57 speakers appearing before the district meetings paid all their own expenses, while a large number appearing before the county societies did likewise. To the Red Cross, we owe a great debt of gratitude for their assistance. To the large number of men who so generously gave of their time and services, often, and should one not say practically always, at a personal sacrifice, our sincerest thanks are due. It was rare indeed to find a refusal to an invitation extended to our lecturers.

The modus operandi by which the county societies choose their own speakers with reference to the schedule supplied by the association, the central office subsequently making all necessary arrangements, has worked out very satisfactorily. As the president of our association, I point with no little pride to the educational achievements which the past year has shown, and, to the committee on education, so ably presided over by our past president Dr. J. Heurner Mullin, must we also extend congratulations for the efficiency manifested in carrying out the work I have just described.

Our Aims and Objects

What are the aims and objects of our association In brief, they are.

(a) To federate and bring into one compact organization the entire medical profession of the province; to extend medical education and to secure the enactment and enforcement of just, medical laws; to promote fraternal intercourse among physicians and to guard and foster their united and individual interests. We should ever strive to enlighten and direct public opinion in regard to the great problems of public health and ever endeavour to make the profession more capable and honourable within itself and more useful to the public.

How is this to be brought about?—If we are to progress and successfully obtain our objective, we must have a united profession working together with enthusiasm and harmony. Let us hold sacred the prestige and memory of our fathers in medicine and do as they did, uphold always the honour of the profession, and, by united efforts, make the practice and teaching of medicine in the Province of Ontario second to none. It should be our duty to so live and conduct ourselves as members of the Ontario Medical Association, that the public shall be made to realize that membership in our organization is the strongest possible guarantee of the honour, honesty and ability of any man or woman engaged in the practice of medicine in this Province.

The pride of every doctor should be his County Medical Society, his Ontario Medical Association and his Canadian Medical Association. Let us put forth every effort to strengthen our county societies, for, as these grow in membership and enthusiasm, so will our Ontario Medical Association increase in strength and usefulness. Likewise the more interest we can develop in our provincial organization, the stronger will become our Canadian Medical Association. It is only by educating the medical men of the country to the benefits that they will enjoy by uniting their efforts that we can hope for a strong national organization. There is always danger that an organization may become top heavy and we must see to it that our foundations are strongly laid. Our foundation is, undoubtedly, the county medical society.

At the semi-annual meeting held in Toronto last December, the annual fee was raised from $5.00 to $10.00. The response has been magnificent, but we are far from 100% strong. Let us not rest in our efforts at organization until every practitioner of medicine in the Province of Ontario has become a member of our association. Let us have a vision of the work that is before us, and, as the Apostle Paul, the greatest organizer the world has ever known, said, "Let us gird on the whole armour of faith and press onward." Let us, as an association, wake up,—especially those of us born, reared and educated in old Ontario. No better universities exist in the world to-day. Let us not cease to study and progress and let us show our cousins to the south that we do not require the emissaries from their institutions to direct us in the path of medical science.

We should enlighten the public on the proper valuation of our services. They should be taught to feel that the general practitioner who carries them safely through an attack of typhoid fever or penumonia has performed as great a service as a surgeon who does an appendectomy or some other critical operation.

I wish to thank the officers of our association for their cooperation and assistance during the year. If we have progressed, and I feel we have, it has been largely due to the undivided efforts of your officials working in unity.

I cannot discuss with you all the activities of your directors during the year that has just passed, as it would take too long, and I shall refer you to the bulletin and to the business programme we are publishing for that information. But there is one feature I must mention, namely,—arrangements have been completed by Dr. Secord, your vice-president and chairman of the library board, whereby the libraries of Western University, the University of Toronto, Queen's University and the Academy of Medicine, Toronto, have been made available to all members of our association. I can conceive of no work of greater importance to our medical practitioners. It requires no comment on my part.

The hindrances to our progress,—indifference, selfishness, and jealousy,—are destructive of all intellectual and moral earnestness. Nothing so lowers our standing in the community as the petty back-biting and quarrelling of our medical men. They apparently lose sight of their high calling and professional standing. Let there be keen competition, but no opposition. We inherited from our fathers in medicine a proud place in the community. Let us see to it that we hand that position down to our posterity, unsullied and unstained. The doctor who gives little of his time to his county medical society becomes self-centred and selfish, is jealous of others, and is a living menace to the best interests of our association. He does not attend his medical society meetings, reads comparatively little, and becomes generally known as a chronic kicker. Ours is the privilege and duty to keep the art of medicine ever before the public. Let the cults rage if they must, but see to it that they do not interfere with our ancient rights and privileges, as such rights and privileges imply service to mankind.

Whatever real position the medical profession has in the hearts of the public is, I think, more due to their unselfish sacrificing lives than to their skill in the treatment of disease. Let us not lose sight of this fact in dealing with the problems that are confronting us at the present time. Time is demonstrating the fact that our profession as a whole spend their lives in service to humanity, following closely in the footsteps of the Great Physician. "And it is strange, but it is true, when the doctor came to say to us there was no need for further calls, we said to him, while we were glad, we too were sad he'd come no more; and I tried that day without success to write some lines of the doctor-man who comes to us when fear lies deep and brings us hope; and every day as days go by, brings cheer with him, and finally, when comes the day that whom he served is well again, we lose him as a doctor-man, but put him down as faithful friend."—K. C. B.

There has been considerable controversy of late respecting the teaching of medicine and the constitution of our medical teaching bodies. In order to gain first hand information, I requested our provincial universities to give me a report of their activities. In my opinion, the reports received are so worthy of attention that I shall herewith read them to you.

Queen's University

The present position of medical education at Queen's University is entirely satisfactory, for it has kept pace with the general progress in the science and art of medicine. Queen's faculty has always kept in mind that the primary purpose of a medical school is to train practitioners for the medical profession.

In 1892, the medical school divested itself of all proprietary interest and became a faculty of the university under the control of the principal and senate. Since that period there has been a steady progress towards a definite ideal, progress which has been qualified only by financial limitations. In 1892, the first full-time professor was appointed. This was in the department of physiology. A few years later, a full-time appointment was made in pathology and bacteriology. In 1902, anatomy was placed in charge of a full-time professor. Since that time, chemistry, physics, and pharmacology have all been taken over in a similar manner, and there are numerous full-time assistants in all these subjects as well. Two years ago, full-time heads, with consultation privileges, were appointed to the departments of surgery and medicine.

It has been thought that a modern medical school could not be carried on properly in a community the size of Kingston. The continued success of this school and the quality of its graduates confutes such opinion. Although a relatively small city, it has long been a medical centre, with the General Hospital, the Hotel Dieu, Rockwood Hospital for the insane, Mowat Hospital for tuberculosis, the penitentiary, and, since the war, Sydenham military hospital, all forming a closely related group within an accessible area.

The main teaching hospital is the "General" which forms part of the University group of buildings and is now being greatly enlarged. About one million dollars is available for the rebuilding of this hospital. The first unit in this rebuilding is almost completed.

Queen's has reformed the curriculum to meet modern requirements. The fundamental sciences, —anatomy, physiology, chemistry, physics, pathology and bacteriology, are no longer water tight compartments, but are taught in close association with clinical subjects. The professors of chemistry, physiology, pathology and bacteriology are members of the hospital staff, are brought into contact with cases, attend clinical conferences and so teach under these influences.

Whatever advances have been made at Queen's are to be credited to the faculty itself and not to outside foreign inspectors and critics. Indeed the inspections and reports of the officials of the American medical association have been a hindrance rather than a help. They have sought to impose methods and details not properly applicable to our circumstances and ideals. When these have been rejected by the faculty, our graduates in the United States have been placed under disabilities, as a result of improper and inferior classification of the school.

Queen's has also accomplished its financial salvation without assistance from foreign corporations. The medical school is a definite part of the university and is supported according to its requirements. It is recognized by the Ontario Government as part of the educational system of the province, and as entitled to receive money grants both for development and maintenance.

Admissions to the first year are limited to fifty. Many more applications have been received than can be accepted. J. C. CONNELL, *Dean.*

University of Toronto

During the past few years the clinical departments of the University of Toronto have been reorganized. First, the Department of Medicine was placed on an efficient basis, this was made possible by the generous gift, in endowment of the department, by the late Sir John Eaton. The department of obstetrics and gynaecology was organized upon similar lines. The last of the three great clinical departments, namely the department of surgery, was put upon a similar footing at the beginning of the present session. The necessary funds for this purpose were made available through the Rockefeller grant.

The following general statement will indicate the main features of the present organization of the clinical departments in the University of Toronto. The objects aimed at are also briefly stated.

The efficient running of a clinical department in a medical school of the size of Toronto with its different teaching hospitals necessitates the devotion of a large amount of time on the part of the Chief of the Department. Not only has he to coordinate the teaching and see that the individual student is getting the best possible instruction, but he has to supervise the work of the junior teachers, inaugurate, stimulate and direct research—all this in addition to his routine hospital work. It is pretty generally felt not only in this continent but in Europe that such services can only be expected from a man who receives sufficient remuneration to compensate him for the large amount of time he devotes to the work.

In some schools, the chief of the department devotes the whole of his time to university and hospital work and is not permitted to engage in private practice. In others he is given such remuneration as will enable him to devote part of his day—time not being specified—to his academic duties. In Toronto, in the departments of medicine and surgery, a moderate full time scheme has been adopted. The chief of each of these departments devotes the whole of his time to university and hospital work with the exception of two hours a day which are allowed him for private practice. The advantages of the last provision are two-fold —(1) he comes in contact with the public and is better able to teach future practitioners by his experience with practice outside the hospital, and (2) it enables him to retire from the direction of the department at an age when he may still be active in practice but, it may be, somewhat stale from the academic point of view.

Under the chief of the department are the various members who are engaged in teaching, in caring for the hospital patients and in research. In the department of medicine, including the subdepartment of paediatrics, these number 45; in surgery, 48; and in obstetrics and gynaecology, 11. The teaching staff is made up for the most part of part-time men, that is men who devote only a small part of each day to teaching and who are engaged in private and consulting practice outside the hospital. In addition to these, there are, in each department, junior full time assistants. The latter are men who have served their terms as junior and senior internes and have, in addition, spent a year in a laboratory. This means that they have spent at least three years in hospital and laboratory work after graduation. Under ordinary circumstances, such a man must go at once into practice in order to earn a living. He usually has to go to some small town where he is completely out of touch with University work. If such a man has shown promise as a teacher and investigator, the junior full time appointment gives him an opportunity of carrying on his work. He begins with a salary of $1,500 to $2,500 a year and, for the first year, he devotes the whole of his time to clinical and laboratory research and teaching. If his work has been up to standard he may be kept on for one or two years more at a slightly increased remuneration with a maximum of $2,500. In these succeeding years, he is allowed to devote two hours of his day to private practice. In this way, he gradually builds up an outside connection so that at the end of two or three years he is in a position to relinquish his full time appointment and come on to the part time staff.

It is a well known fact that most original investigation has been done by men in their junior years and that it is very rare to find a man doing original work who has not begun it early in his career. The scheme outlined gives promising men the chance of training in research and is bound to result in good work being done. At the same time, he is being trained as a teacher under the eye of his chief. He is in contact with the outside public for the two hours a day allowed him for practice, so that, when he goes on the part time staff, he is a most useful member of the department, one who can be depended upon to give the patients in the hospital the best of treatment, the students the best of teaching, and will continue to be interested in research and so be likely to be a credit to the university and hospital.

Such junior full time appointments will be available to suitable men who have had to go into practice shortly after graduating, provided they have had some hospital training as internes and have had a training in a laboratory.

In the course of time, if this scheme is carried out in its entirety, the whole of the teaching staff in the clinical departments will be composed of men who have gone through this training, the senior members composing the great part of the staff being on a part time basis and the junior men in training on a full time basis. The scheme is in this way progressive, providing always adequately trained junior men to take the place of the seniors as they retire on account of age or other causes. The effect of the present organization upon the university and hospital staff will therefore not be fully felt until after the lapse of some years.

A. Primrose, *Dean.*

Western University

Our new medical school building, which represents an investment of approximately $450-000.00, was officially opened last fall, classes having been held in it since October, 1921. The new building is up to date in every particular and affords unusual facilities for study in the laboratory branches. A staff of well trained specialists is in charge and very efficient work is being done.

The clinical work done in Victoria and other hospitals has also improved. Definite arrangements have been made with the board of trustees of Victoria hospital whereby the attending staff of the hospital is appointed following recommendation by the board of governors of the university. Hospital records and laboratory facilities have been greatly improved. The new "War Memorial Children's Hospital" is about ready for occupancy and will greatly increase the value of instruction to medical students, particularly as regards the diseases of children and out-patient work.

The course of instruction here covers a period of six years, the first year now being devoted wholly to so-called pre-medical work in science, language, etc. Beginning with the session of 1923-1924, two years of such pre-medical work will be required and the medical course proper will be four years in length. The length of each session will probably be increased under these conditions to at least thirty-two weeks. The length of each session at present is thirty weeks.

One important matter here is the development of our library in the medical school building. Great progress has been made and there are available already a large number of complete files of the more important medical publications, as well as a large number of reference books. There is developing in the library also an important historical collection. The interest in this section is increased by the medical historical society, which is a student organization meeting regularly for the discussion of the history of medicine. This organization is giving considerable stimulus to our better students.

The auditorium in our medical school building is used by the Western Ontario Academy of medicine for meetings and clinics. The academy has brought a number of eminent men to London, and the value of these meetings is self-evident, not only to the profession, but to the students as well. PAUL MCKIBBON, *Dean.*

We shall now turn to the sixteenth annual report of the Carnegie foundation for the advancement of teaching, by President Pritchett. He begins his article by stating that the primary purpose of the medical school is to train practitioners for the medical profession. He then outlines the method of teaching recommended by the Carnegie foundation and closes his remarks by stating that scientific medical practice is rooted in the laboratory and hospital. The training of the medical student to-day prompts him to rely more and more upon the scientific tests of the laboratory. This process has accentuated the tendency long noted which brings a growing proportion of medical graduates into the cities, towns and fair-sized villages. The isolated country doctor, necessary as he has been, fruitful as he may be in the prevention and cure of disease and in the relief of suffering, works under conditions that must be unsatisfactory to men trained in the modern medical schools. This reason will weigh most with the more capable graduates of the medical schools. The result is that the country-side takes a constantly diminishing proportion of medical men from the school, and those who come to a country practice are likely to be amongst the less alert and less scientific minority. The difficulty of supplying properly qualified men to the rural districts has been a matter of earnest debate for some time past in the medical societies and among the thoughtful leaders of the profession It has been seriously proposed that certain medical schools be kept on a lower plane of instruction with the notion that graduates of these schools should form the recruits for the country medical practitioners.

Owing to the amount of discussion that has been going on in the public press and our medical journals of the affairs in connection with the University of Toronto medical faculty, I am certain you have all been greatly interested in the reports I have just read to you. These reports show plainly that all our universities are proceeding to a greater or less extent on similar lines in their methods of teaching and staff appointments. That being the case certainly proves to my mind that some change from former methods of teaching was necessary, and that our universities are endeavouring to meet the situation fairly, and that they are fully alive to the present day requirements. We hear so much about the time wasted in laboratory research work and that students are being taught subjects that are not at all necessary to the average practising physician. Probably were the government thoroughly aroused to the necessity of establishing county laboratories and giving our graduates an opportunity to continue to enjoy the benfits derived from laboratory investigation, conditions would be entirely different. A communication received by me puts the whole matter very clearly. It states, "I cannot help thinking that a great deal of the criticism which we receive from time to time is due to the fact that the professional public are kept in ignorance of the situation. They do not understand our methods because they do not know what we desire to accomplish. We have certain ideals and we are doing our level best to secure efficiency in order that the general practitioner may obtain an education in medicine in the University of Toronto, second to none." What he says in reference to Toronto can be said equally well of Queen's University and of the Western University.

In planning a six year course, I find our universities have not followed the American plan of having the student spend two years in a University arts course, and then four years in medicine. They have so arranged the subjects taught, that our students, on entering the university, begin at once a well defined combined course of arts and medicine. He is a medical student from the first, and, as such does not feel he is wasting time taking an arts course. Further, I think it makes a more uniform course, as it is a well known fact that some universities do not have as high a standard as others, and, further, their course of instruction may vary in subjects taught.

After making as complete a survey as possible for one in my position, of the work being carried on in different universities, and the system of instruction used, I am convinced that our universities are not copying either German or American methods, but are developing well conceived plans of their own.

No one to-day questions the wisdom of having whole time professors in charge of the preclinical work. It has been proven a success in every way, then why condemn the appointment of full time professors in the clinical departments before they have been fully tried out. It appears to me that the main advantages in the whole time system in the major clinical departments are:—(1) The head of the department has more time to administer the department, both in the university and the hospital, to coordinate and systematize teaching, to supervise the training and work of the junior teachers and to direct clinical investigation. (2) It affords a greater opportunity for recent graduates to acquire a suitable training to equip them for the practice and teaching of clinical work. It is important that the organization of the clinical departments in the university and the medical services be such that the treatment of the sick, the education of the public in the prevention of disease, and the training of the undergraduates and graduates becomes the common interest of the staff in both the university and the hospital. This, I believe, is being attempted by all our universities. There is one striking contrast between the American ideals and the Canadian, namely, whereas the former are considering the establishment of lower grade medical schools for the training of country doctors, our Canadian universities hold an entirely opposite view. One of our leading professors in a communication to me states: "It is clear, however, that it is just precisely the country doctor who should receive the most comprehensive training since he must to a great extent, do his work alone, without the advantage of specialists immediately available with whom to consult."

I think it will be readily conceded that the training to qualify a man for country practice requires to be more thorough, and more comprehensive than that required by a young man who intends to practise medicine in our cities and larger centres. The former is thrown entirely upon his own. He has none of the aids such as hospital facilities, expert consultant, X-Rays or laboratory work to assist him. He is compelled by the very nature of his work to depend upon the faculties that God has given him and, if he is to be successful, and his patients are to receive the best that medical science can give them, it must follow that those faculties must be intensely and intelligently trained.

A well known American report states that Canada and the United States are medically one country; and also that, through the influence of the American Medical Association and its Council, the unfit medical schools in Canada and the United States are being weeded out. The latter statement may be true in the United States, but, so far, I have failed to observe that any medical school in the Dominion of Canada has been closed.

Long before that excellent report was made by Mr. Flexner, our universities had been looking into the future and were already making such advances as were necessary to meet the new and changing conditions brought about by laboratory research. I am proud to state that I do not think they required the advice of our American cousins to take this step, and further, I am satisfied that the professors in our universities are quite capable of keeping abreast of the times.

To me, it is quite apparent that there is a movement on foot across the line to internationalize medical science and, unfortunately, there appears to be a leaning in that direction among some of our men. It may be on account of my United Empire Loyalist forefathers and my early training but, with that movement I cannot agree. We hear of the British School, the French School, the German School and the American School. Let there be developed the Canadian School. I understand that a movement in this direction has been inaugurated by our Canadian universities. Let our universities unite and, by original research and development, build up a national school of medicine of our own. Assimilate from the others what seems best, but ever strive to develop our own individuality and ideals. Build up a school of national Canadian medicine, with Canadian post graduate work. Have our own fellowship degree and let it be of such a high standard that the world shall know and recognize its worth. We must preserve our identity as a nation or be swallowed up by our larger neighbour to the south. Give us a degree of fellow of Canadian medicine and surgery and urge upon our students the advisability of striving to attain that degree. We have men with the ability; we have the well equipped universities; let them give us the ideals.

> Bring me men to match my mountains;
> Bring me men to match my plain;
> Men with Empires in their purpose,
> And new eras in their brain;
> Pioneers to clear thoughts marshalled,
> And to cleanse old errors fen;
> Bring me men to match my mountains;
> Bring me men.

Problems

Let us now pass on to some of the problems which await our solution. It is a well-known fact that recent graduates from our medical schools are loath to begin the practice of medicine in our rural districts. As a result, the cities and towns, large and small, are becoming over-manned, while large areas in the country which formerly had splendid medical service are to-day found deserted by practitioners.

There must be some explanation to account for this state of affairs. After spending long years in study, especially in this age when the student and graduate becomes duly impressed with the value and worth of laboratory pursuits, he hesitates to choose for himself the sphere of activity where he obviously knows that the laboratory can occupy but a very small part of his work. Very few recent graduates could afford to equip a laboratory; and, even were that possible, the country practitioner has little time to devote to laboratory work and research. How, then, is this situation to be met? I can see but one solution. The time has come when there should be established in every county centre a county laboratory with a technician in charge. To this, the country doctor could send specimens for examination, and could personally see the results, and not be compelled, as many are to-day, to send specimens one hundred or more miles to the nearest laboratory. Does it seem fair that the man engaged in the practice of medicine in the large centres having Government laboratories should be privileged to enjoy the benefits derived therefrom, while those engaged in the struggle of practicing medicine in a country district are deprived therefrom? Government laboratories should be so distributed that their benefits would be easily within the reach of all.

With the establishment of county laboratories, let us have efficient, properly trained, whole time county medical health officers and trained municipal matrons. You say, "Oh, but, at the present time, we have efficient municipal health officers and inspectors." Let me report one instance. Last December, a case of scarlet fever was found three miles east of Trenton. Next morning, another case was discovered nine miles east. The municipal medical health officer was notified, and that afternoon he placarded for scarlet fever fourteen homes on what is known as the Kingston Road, between Trenton and Belleville, a distance of some twelve miles. Not one had been reported, and, had not a medical man discovered the first two and reported them, probably they would never have been found out. People were hiding the disease. Did the municipal health officer do anything? Yes, he put up the placards, that is all. Was it all? No. Milk from those homes continued to be sent to the cheese factory or sold to the people living in Trenton and Belleville, with the result that the disease spread, the type became more virulent and several deaths followed. An epidemic broke out in Trenton following a certain milk route. There must be something wrong and we must have a remedy. I would suggest the dismissal of all municipal medical health officers, except in cities of over 20,000 population, and, in their places, the appointment of qualified whole time county officials. Place such officials in charge of the laboratories; moreover, make part of their duties, besides looking after contagious diseases, the inspection of cheese factories, butter factories, milk routes, manufacturing establishments and all public buildings such as school houses, poor houses, jails, etc. With the duties I have outlined, together with the supervision of the work of the municipal matron, I think the services of a full time, well paid official could be thoroughly utilized. The appointment of municipal matrons is, in my opinion, a vital necessity in the province of Ontario. In our own county, there are settlements twenty-five miles distant from a doctor or trained nurse. These areas and many like them throughout the province show great need and offer opportunities for excellent service on the part of these municipal matrons. Now, what would be the duties of a municipal matron. In the first place, take away from the Department of Education the medical inspection of schools, and put it where it belongs, in the department of health. Let the municipal matron be the nurse inspecting the school children. Let her also be the truant officer. Who can better get into a home and reach the hearts of the parents than a well trained public health nurse? Had there been one in the township of Sidney, such conditions as existed on the Kingston Road last December, and to which I have already made reference, would have been impossible. She would have discovered the disease and quickly and efficiently, with the assistance of the county medical health officer, stamped it out. Those found guilty of concealing the disease would have been punished and the sale of milk stopped. It is a well known fact that nearly all the epidemics of diphtheria and scarlet fever are directly traceable to carriers. The nurse, on inspecting schools, could send swabs from all discharging ears and noses to her county laboratory, and the county officer would at once know if any of the suspects were carriers. If any were found they could be quarantined and treated, an epidemic could probably be prevented, lives spared, and such conditions as septic endocarditis and deafness greatly lessened. Going about the municipality, her services would be available to the poor widow left with a small family, to the poor in general, as well as to the aged and infirm pioneers. One of the greatest problems we have to face in this province is the increasing numbers of that class called morons. They are fast filling up all our institutions, and what to do with them is a problem. They co-habit or inter-marry and are raising a large number of mentally deficient children. They are mental, moral and physical degenerates, a menace to society and a prey to insanity, vice and disease. Up to the present time, all we have been doing for them is to put the morality officer on their trail. They hate our society, our civilization and our laws. We push them aside or brush past them. It is another picture of the road to Jericho. These people came originally from good stock, hence the name degenerates. How are we to reclaim them? Let us take Mr. and Mrs. Doe as examples. Mrs. Doe becomes pregnant. Instruct her to notify the municipal nurse who will visit the home and begin pre-natal care. A doctor will also be engaged to take charge of the case. Mrs. Doe will be seen frequently, the various requisites will be supplied, and the doctor attending will not be compelled, as I have been on many occasions, to use a handkerchief as the only clean cloth available to be used as a dressing. The nurse is notified and at once takes charge of the case. She may not be available at the time of Mrs. Doe's illness, but there are always plenty of neighbour women ready to help. And just here let me say, after the doctor's work is done, his bill would be sent to the municipal nurse who would O. K. same and send it on to the Board of Health for payment. I sincerely believe that the municipality should pay for all indigent obstetrical work. Because a woman is poor, she should not be compelled in her hour of travail, to depend upon the charity of some doctor in the community as is the prevailing system at the present time. Now, let us follow the picture further. The nurse visits the home from time to time, sees that it is kept clean, and watches over the growth and development of the child. When the latter is of school age, the nurse visiting the school sees that the child is present; if not, back to the home she goes and sees to it that the child is promptly sent to school, supplying clothing, books, and any other necessaries. Ever thoughtful, watchful, patient and persevering, the nurse watches over the growing child. What is the result? Along with the development of the mental faculties of the child that must come from years spent at school, there is developed self-respect, without which no animal is of any use—respect for our civilization and respect for our laws. Watching over generation after generation in this way, I feel certain that, as time goes by, we can educate, develop and train them back into useful citizens. Is it worth while? As the average net value to the state of every normal adult is said to be $4,000.00, supposing our municipal matron saves but one child a year, her salary and expenses would be paid. Suppose, in addition, she should increase the efficiency of ten 10%, five 20%, see what value she is rendering the state. Count the present cost and then consider the future. Must something not be done without delay?

One could continue this line of thought indefinitely, but the above illustrations will no doubt suffice to make clear my point.

I hope you may see with me how closely the three, county laboratory, county medical health officer and municipal nurse are allied. One naturally follows the other, and, if we are to have efficient enforcement of our medical health laws, the three are essential. At the same time, we must not lose sight of the fact that they must materially aid the general practitioner in his work. These three, the county laboratory, the county medical health officer and the municipal nurse at once lead us up to the fourth problem we have before us, namely, the municipal hospital.

Our large general hospitals are second to none. Our county hospitals are good, but require more equipment to make them as efficient as they should be. But there is an almost total lack of that much required institution, the small municipal hospital. And what is the crying need for the municipal hospital? First permit me to say that many lives are lost every year because of the inability of the patient to be transported to the larger centres. For emergency work, accidents and obstetrical cases, the need is most obvious. To take care of the poor who will ever be with us, such hospitals are needed. These hospitals would also serve as a meeting place for country doctors. Here they could come together, discuss their cases, keep in touch with hospital work and ideas, hold their medical society meetings, clinics and clinical lectures. Think of the benefit that would accrue to both our country practitioners and the public for the lecturers could illustrate their talks with cases, with proper case reports and laboratory records. This would give the country doctor the very best of post graduate work, keeping him constantly up to date; and this further implies that while he stays on the job, he is being brushed up on the essentials of his daily practice. His increased efficiency must necessarily be reflected upon the public whom he serves.

The ideal for which we are all striving, that which will render the public the most good, appears to be something such as follows:—Our large general hospitals as they do at present, would supply the expert internist and surgeon. The county hospital would develop and supply the local consulting staff, while the municipal hospital becomes the centre to which the general practitioner sends his cases and there carries on his work with the assistance, where necessary, of the county consultant or the expert from the larger centre.

Closing

There is a tendency on the part of many to decry the country doctor. They say he is inferior in knowledge, in medical skill, and is, as a class, not up to date. Some go so far as to say he should be re-examined at stated intervals to compel him to keep properly posted.

Come with us to the country doctor's home. Drive with him in daylight and dark, through rain and mud, slush and snow, day after day, night after night. Worn and weary, tired to death, but still carrying on. The sense of duty as well as necessity for making a livelihood compel him to keep going on, on, on. Desk littered with medical journals, many of them wrappers still unbroken, books piled up waiting to be read; he has pride, ambition, and a desire for knowledge, but how many hours a day could you read following his mode of life? How often, going to bed completely fagged with a book in his hand, determined to read up some case that is worrying him, he falls asleep, his wife turning out the light. Doctor Stucky, President of the Kentucky State Medical Association, states, "Close observation as years go by of medical men convinces me that the real practitioner of the science and art of medicine does not make a diagnosis and formulate conclusion from data on half a dozen or more typewritten slips; but by observation and experience, the doctor learns to interpret the different data and prove or dis-prove them by what his own fingers feel, his own ears hear, and his own eyes see, aided by intuition which has been well defined as subconscious reassurance based on previous experience. Not for one moment do I believe that the day of individualism has passed, nor do I think it will ever pass."

To my mind, this depicts the true country doctor. The newspapers delight to herald the wonderful deeds of our highly trained specialists, but the artist and poet, never. They immortalize on canvas and in song the country doctor.

The country doctor does not wish sympathy. Just lend him a helping hand. Thank God for the Ontario Branch of the Red Cross Society that has assisted in the carrying out of post graduate work unequalled in any other country in the world.

Let me live in a house by the side of the road,
Where the race of men go by,—
Men who are good, men who are bad, —
As good and as bad as I;
I would not sit in the scorner's seat,
Nor hurl the cynic's ban;
Let me live in a house by the side of the road,
And be a friend to man.

SYPHILIS—THREE YEARS' OBSERVATION*

E. J. Trow, M.D.

Toronto

THE following report represents an attempt to determine the results of treatment in a group of cases, over a period of three years in the ordinary syphilis clinic. The cases, 562 in number, were in no way selected but are taken from our roll in alphabetical order and are those reporting at the Toronto General Hospital special treatment clinic, during the years 1916, 1917, 1918.

Wherever possible the Wassermann tests are noted over a period of three years, but as will be seen by the charts many of our patients discontinued treatment long before this period had elapsed.

Numerous difficulties confront one in the care of syphilitics and the most important one is the patient himself. The patient, while he suffers from visible or distressing symptoms, is usually quite willing to continue treatment but as he begins to feel better he becomes less and less enthusiastic, soon failing to appear at all. This occurs in spite of the efforts of the social service nurse and against the advice of the medical officers of the clinic and against the instructions in the pamphlets of the Board of Health. So much has been written in the press regarding venereal disease that it has become more or less commonplace and does not seem to hold out the same terror in the minds of the public as it once did. This I believe is also true to some extent among the medical men. It is particularly noticeable since the general use of salvarsan and other arsenicals that patients are surprised when told they are suffering from syphilis believing themselves cured as the result of one or two intravenous injections: this is not always their own belief but was often the opinion of their physician. The public are well acquainted with the blood Wassermann test but are unable to appreciate the difference between a negative reaction as a result of treatment and a negative reaction in those who have never had the disease. Many of our cases have discontinued treatment after being told of a negative reaction.

I think all will admit that a three year period of observation is the absolute minimum for any type of syphilitic infection yet it will be seen how very few reported for that length of time. No case was neglected by the social service nurse as cards were sent requesting them to return and, failing to hear from them, calls were made urging them to return; if they had moved every effort was made to locate them but in a large city numbers of them were impossible to trace.

The 562 cases are divided for convenience into primary, secondary and tertiary. The primary cases—54 in number—presented various types of chancres both genital and extragenital. All cases had a dark field examination on admission as well as a Wassermann test. Forty-three proved to be Wasserman positive and these cases had lost valuable time in beginning their treatment. Of the eleven dark field positive but Wassermann negative cases only one ever became positive during the period of observation; whereas, four of the Wassermann positive cases after becoming negative, again became positive. A large number—24—discontinued treatment during the first six months and twelve of them took less than five injections. It is a noticeable fact that 13 of the positive cases discontinued treatment in the first six months on acquiring a negative Wassermann and from observation of similar cases one can be sure that in some of them at least active signs will crop up later. The three year period finished with thirteen cases twelve of which had remained negative for the previous eighteen months. I am quite sure that had the bulk of these cases been regular attendants nine out of ten of the entire group would have remained clinically and serologically negative. It has been said that extragenital infections are more virulent than genital ones but in my opinion this is not the case but merely more time has lapsed before the diagnosis is made. In my experience I have never seen an extragenital chancre early enough to present anything but a positive Wassermann. The average amount of treatment is noted on the chart of each drug used. It has always been the policy of the clinic to make the treatment suit the individual, but an attempt is always made, in so far as possible, to follow the intravenous (diarsenol) injections by intramuscular injections of mercury; then, after a short rest, a second course of diarsenol and mercury. Some of our cases in this group received the mercury by inunction and most of them received iodides for varying periods.

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*Read before Section of Medicine, Academy of Medicine, Oct. 11, 1921.

54 CASES PRIMARY SYPHILIS 3 YEARS' OBSERVATION

Average) Treatment)	Intravenous	10.3
	Mercury Intramuscular	6
	Mixed Treatment or Rubs	6 Weeks

Prelim. Wass.	1-6 Mths.	2-6 Mths.	3-6 Mths.	4-6 Mths.	5-6 Mths.	6-6 Mths.
Discontinued Treatment	**11**	**4**	**4**	**2**		
POSITIVE WASSERMANN 43	17	9	7	3	1	1
Wass. Negative Dark Field Pos. 11	37	21	18	14	12	12
Discontinued Treatment	13	1	4	2	0	0

54 CASES PRIMARY SYPHILIS

Result of follow up for 3 years
Average No. of visits - 17

Still under observation	13
Transfer	2
Their own Physician	3
Left the City	4
Cannot Locate	20
Refuse to Attend	2
Died	1
No Record	9
	54

The secondary cases, 130 in number, all showed various signs of wide distribution of the infection; the time varying from three or four weeks after the initial lesion to lesions appearing some months after infection. Many of these cases were admitted to hospital on account of open infectious lesions and there received their first course of treatment. For two years, 1917 and 1918, a spinal puncture was a routine procedure in the wards, and a variation from normal was noticed in over half of these cases. This change from normal was usually a slight increase in the cell count with faint trace of globulin but at times the Wassermann was strongly positive also. I do not believe that these patients are doomed, but, on the contrary, recover very well under careful treatment. Case B.G., admitted January 1918, primary sore on lip with maculo papular rash, blood Wassermann very strongly positive with cellular increase, globulin and Wassermann positive in the spinal fluid; under treatment rapidly became negative in both blood and spinal fluid and has since remained so. At times the blood Wassermann becomes rapidly negative but some months after one is surprised to find serological changes in the nervous system and later on the blood Wassermann becoming positive such as D. R. Mc., admitted to the clinic February 1917, showing penile sore, macular rash, pharyngitis etc.; under diarsenol and mercury, Wassermann in blood became rapidly negative remaining so for a year; on examination of the spinal fluid he was found to have 160 cells, marked globulin increase and positive Wassermann with very strongly positive Wassermann in the blood. This case feels well and has shown no nervous symptoms yet a negative quickly becomes positive on interrupting treatment for any length of time.

Among these 130 cases, four cases were noticed which we in the clinic have termed "floppers," i.e., cases that even while under constant treatment will go negative, become positive and again become negative all in a short space of time without any apparent cause. I do not believe the question of a new infection can be considered in this connection but possibly a lighting up of foci allowing Wassermann producing bodies to escape may be the explanation. I may say that in this series these four cases occurred in women who had had syphilitic babies.

As will be seen by the chart, 51 discontinued treatment still "Wassermann positive" and 45 with a negative Wassermann—only 32 or 25 per cent completing the three year observation; twenty-four of the 130 cases made less than ten visits to the clinic and discontinued receiving only diarsenol and therefore a very unbalanced course of treatment.

130 CASES SECONDARY SYPHILIS 3 YEARS OBSERVATION

Average) Intravenous - 11
Treatment) Mercury Intramuscular - 7.5
Mixed Treatment or Rubs 11 Weeks

Prelim. Wass.	1·6 Mths.	2·6 Mths.	3·6 Mths.	4·6 Mths.	5·6 Mths.	6·6 Mths.
Discontinued Treatment	21	10	10	6	4	
POSITIVE WASSERMANN 130	80	43	37	25	16	11
NEGATIVE WASSERMANN	50	48	38	32	27	21
Discontinued Treatment	18	6	8	8	5	

130 CASES SECONDARY SYPHILIS

Result of follow up for 3 years
Average No. of visits - 20

Still under Observation	32
Transfer	15
Their own Physician	4
Left City	14
Cannot Locate	40
Refuse to Attend	3
Died	0
No Record	22
	130

378 tertiary cases showed a great variety of clinical lesions and were referred to us from every department in the hospital. The improvement in their health and clinical condition is almost miraculous in the majority of instances. Many, however, showed very little or no improvement and a few became steadily worse. These cases were ones in which the syphilitic process had actually destroyed tissue and were beyond repair, such as degenerative changes in the brain or spinal cord, optic atrophy, etc. It is interesting to note that in some of these cases, under intensive treatment, the Wassermann became negative; they gained in weight and strength but showed no change in their clinical condition except for the tonic effect of their treatment.

It is readily seen that the tertiary cases required longer treatment to relieve active symptoms. By a comparison of the number of visits made they were also cases that, in many instances, years ago, knew that they had had the disease and appreciated the fact that it required months and years of medicine.

In this group of cases it has often been noticed that active and energetic treatment sometimes does harm, the patient losing weight and appetite, suffers from loss of sleep and headache, etc., and in these cases treatment should be discontinued for a time at least. This is important and while it is probably desirable to attempt to obtain a permanent negative Wassermann, yet the general health of the patient must not be forgotten. One is apt to forget that some of these patients have lived in good health for years with little or no treatment. At times some of these late cases, through continued treatment, seemed to present exacerbations of old lesions.

In this tertiary group 25 were noticed whose reaction varied considerably and a few would vary even without treatment.

The three year period finished with 72 reporting, showing 33 positive and 39 negative; but I have no doubt that some of these 39 without more or less treatment will again become positive.

The bulk of positive cases after three years are made up of clinical types of syphilis, such as heart and nervous cases with a number of women who have born syphilitic children.

378 CASES TERTIARY SYPHILIS 3 YEARS OBSERVATION

Average) Intravenous - 12.6
Treatment) Intramuscular Mercury - 7.7
Mixed Treatment and Rubs 18 Weeks

Prelim. Wass.	1-6 Mths.	2-6 Mths.	3-6 Mths.	4-6 Mths.	5-6 Mths.	6-6 Mths.
Discontinued Treatment	107	42	26	20	16	2
POSITIVE WASSERMANN 378	293	175	114	73	49	33
NEGATIVE WASSERMANN	85	84	82	68	55	39
Discontinued Treatment	12	21	29	17	16	0

378 CASES TERTIARY SYPHILIS

Result of follow up for 3 years
Average No. of visits - 28

Still under Observation	70
Transfer	43
Their own Physician	28
Left City	38
Cannot Locate	103
Refuse to Attend	29
Died	9
No Record	60
	378

It is not the purpose of this paper to go into the clinical or treatment side of syphilis in detail, but rather to see over an extended period what Wassermann results, and what control we might have over our patients; and, it seems to me, from these statistics, we have very little.

Some of our patients attended very religiously, but often they were not the ones who should have attended so regularly, as at times the younger and earlier infections were more or less impossible to keep under control. All syphilitics need individual attention as far as possible and it would be much better if this attention could be given by two or three men co-operating. Unfortunately these clinics are getting so large and unweildly that this is impossible, the only solution appears to be more clinics.

In conclusion, I would like to thank Miss Grant, our social service nurse, for her work in making this paper possible and Miss Adams, the clinic secretary, for her aid in compiling the reports.

THE MEDICAL CARE OF POST-OPERATIVE ABDOMINAL CASES*

Robert Dawson Rudolf, M.D.

Toronto

IT may seem strange to you that a mere physician should be taking part in a discussion on the care of surgical cases. My chief excuse for doing so is that our Chairman asked me to speak and I have had sufficient experience in the Army to know that a request of this kind must be taken as an order.

As regards the relation of the physician to surgery, I quite think that when once an operation has been decided upon, a case should be in the charge of the operating surgeon until the patient recovers from that operation; but in many of the complications that may arise the medical skill and experience of the physician may be of service to the surgeon in his steering the case back to health, and should be freely used by him. Thus, although the attending physician temporarily gives over the helm to the surgeon (for only one helmsman should steer at a time) still he should always be available in case his special knowledge be required by the surgeon.

The suffering connected with a surgical operation has shifted from one stage to another as the technique of surgery has changed and advanced. There are three stages to be considered.

1.—The preparation of the patient for the operation.

2.—The operation itself.

3.—The few days that follow the ordeal.

In pre-anaesthetic days the distress, of course, was chiefly during the operation, and, nowadays, we can scarcely realize what the suffering must have been after the patient had been committed to the operating chair or table, and when legally any plea of his to be let off could be and was ignored. The scene is well depicted by Dr. John Brown in Rab and his Friends, and one can picture but never now sees what Ailie went through as the incision was made and the nerves cut in the removal of a breast. No wonder that the great dog, Rab, 'growled and gave impatient yelps' as he watched from a distance where poor Jeems held him! I am afraid that nowadays neither James nor Rab would have been admitted to the operating room, or at least would have had to wear masks and sterilized gowns. Now, the patient is spared all this and from the time that he goes under the anaesthetic until he wakes up in bed he is unconscious of any pain, although, as Crile has emphasized, his nervous system has still been bombarded with afferent impulses which may produce subsequent shock. Chronologically speaking, the next stage that gave rise to suffering was during the period when sterilization of the area of the impending operation was in vogue, and people would often say that they had more pain and discomfort following the shaving and scrubbing and chemical sterilizing of the skin than from anything else connected with the ordeal. This stage no longer exists, the necessary sterilizing being done chiefly by means of iodine immediately before the operation.

The third, or postoperative stage still remains, and it is with this that we are now concerned.

There is bound to be a certain amount of misery attendant upon the awakening from the anaesthetic, while the patient still reeks of ether or other drug. Much of this suffering is avoided by the now common practice of washing out of the stomach while the patient is still unconscious, but until the blood is free of the anesthetic he more or less feels the effects of it. Beyond this, if all is going well, the question becomes one of dieting, and the management of the bowels.

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As regards the diet it is generally agreed that for the first twenty-four hours after the operation there should be practically no food given by the mouth, and after that, if all nausea has disappeared, a gradual feeding, at first with small amounts of fluids. But if the stomach remains irritable for more than a day or two it is well to give some nourishment by the bowel. Rectal feeding has been practiced since the times of Galen and Celsus and so has much historical backing. Lately its value has been a good deal discounted and we know that many of the substances thus given are not absorbed; some are, however, and thus a partial nourishment can be achieved which may be of great value. Water, monosaccharides, alcohol, the simplest forms of amino-acids, and probably salts, are rapidly taken up by the lower bowel, and a nutrient enema composed of these can easily be constructed. One that I have often found useful is that suggested by W. E. Fothergill (1) which is as follows:

Glucose	50.0 c.c.
Alcohol	50.0
Calc. Chloride	0.3
Sod. Bicarb.	3.0
Sod. Chloride	4.0
Distilled Water	1000.0

1500 c.c. of this, equalling 825 calories, to be given daily in four enemata. Peptonized or pancreatized milk is often used and if the predigestion has been prolonged the proteins are so reduced to simple amino-acids that they are freely absorbed. Or any of the commercial amino-acids may be used instead. Cornwall (2) gives the following recipe which should be useful:—

Dextrose	20–50 gm.
Alcohol	20–50 c.c.
24-hours pancreatized milk or commercial amino-acids	1000. c.c.
Common salt	9.0 gm.

of this preparation 250 c.c. may be given every four hours, having a caloric value of 420-755 calories. A very simple nutrient enema is a ten per-cent solution of glucose.

As regards the management of the bowels there is much difference of opinion. If these have been well cleared out before the operation and there are no symptoms requiring purgation then it has always seemed to me that the bowel should be rested rather than stimulated. I agree with O'Day, when he says, "With no intestinal obstruction, constipation never causes grave conditions". (3) This writer gives some experimental work which, if confirmed, is of interest. In 200 blood cultures done on 100 individuals the results were always negative before the giving of a cathartic but were positive in 62 instances after such administration. The bacteraemia lasted for about 20 hours. He believes that the cathartic irritates the mucous membrane and so permits the passage of bacteria into the chyle, lymph and blood streams. An enema is not open to as many objections and mineral oil to very little. I notice that Haubold's (4) rule is to give no purgative for ten days after the operation unless for some special indication. I would go as far as to say that the question of a purgative should be decided by the medical attendants and not be left, as is too often done, to the nurse or even the patient himself.

Certain symptoms and conditions are prone to arise in the post-operative stage which will require special treatment. I will only attempt to discuss a few here. Such are pain, thirst, prolonged nausea and vomiting, hiccough, acute dilatation of the stomach, and tympanites. Shock is too big a subject to take up now.

Pain—The degree of pain felt by an individual depends upon two factors; viz. the amount and intensity of afferent impulses that are arriving at the brain centre, and in the next place the sensitiveness of the pain centre to such impressions. Some people are so sensitive to pain that a slight focus of irritation may cause them acute suffering, while, on the other hand, we see those who have little distress from what apparently should cause a great deal. Pain is a subjective thing. When it is evidently present it is for the surgeon to say if there is any removable cause in the wound itself. If not it must be treated symptomatically and here opium or one of its alkaloids is our standby. Of these alkaloids morphia is by far the best analgesic, and yet one often sees codeine used although pharmacologically it has far less effect in this direction than morphia. I agree with H. C. Wood, Jr., when he says "as a somnifacient or analgesic codeine is practically useless." (5) It is only a quarter as strong as morphine and if given in large doses is apt to excite. When morphia is given it is well not to combine atropine with it unless for some special reason as it is apt to cause dryness of the fauces. In mild instances of pain acetylsalicylic acid has some relieving effect; far more than any of the other salicylic bodies.

Thirst is often a distressing feature of the postoperative state. It is largely in proportion to the amount of fluid lost by haemorrhage or by vomiting, or secreted as in acute dilatation of the stomach. Dryness of the throat goes along with thirst and hence the suggestion of the avoidance of atropine where possible. In slight cases the frequent washing out of the mouth with a warm alkaline solution is of value. Ochsner speaks of the comfort giving by chewing gum. If the symptom be severe water may be given by the bowel, and in urgent cases subcutaneously or even intravenously. This last method must be employed with caution or acute oedema of the lungs may result.

Nausea and Vomiting are almost inevitable after a general anaesthetic, but if unusually severe or prolonged, will suggest other possible causes. The following five varieties may require very different treatment.

1.—That due directly to the anaesthetic.
2.—That due to obstruction, early from paralytic ileus and later from bands or adhesions.
3.—From acute dilatation of the stomach.
4.—From toxaemia.
5.—Neurotic.

If the vomiting from the anaesthetic be severe, gastric lavage with a weak alkaline solution is generally indicated, although in milder cases the free drinking of warm fluids may be sufficient. This makes any vomiting easier and also tends to wash out any irritating contents of the stomach. If gastric lavage be not effectual many next use cocaine, ¼ grain by the mouth, either alone or combined with say 25 minims of 1/1000 adrenalin solution. Counter-irritation in the form of mustard over the epigastrium is usually useful.

Obstructive vomiting is best treated with lavage, but if from bands or adhesions, may require a further operation.

Acute dilatation of the stomach is a rare but grave complication of abdominal operations. Sometimes the dilatation involves also the duodenum, and dilatation of the duodenum alone has been described by Wilkie (8) and others. We have no time to discuss the etiology here. It usually appears about the third day but may occur much earlier or later than this. There is great depression with little or no pain but vomiting of large quantities of olive-green foul-smelling material. Gastric lavage, repeated if necessary, is the best treatment and, of course, the patient should have nothing by the mouth. Pituitrin, ½-1 c.c. hypodermically is of some value.

In the toxic types of vomiting the channels of elimination should be flushed with normal saline. Glucose and soda solution by the bowel or intravenously or subcutaneously is most effectual here.

Neurotic vomiting should be treated with large doses of bromides, or with chloral hydrate bromides by the bowel. The stomach tube has often a powerful psychic influence here.

Hiccough is a common and sometimes very serious complication of abdominal operations. It is a reflex manifestation, usually the source of irritation being in the stomach and hence lavage with alkaline solutions is of value. If after this the irritation still remain, carminatives, such as Hoffman's Anodyne, often help, but in my experience the two most useful drugs are atropine hypodermically, and chloretone by the mouth. In hysterical patients valerian may be useful.

Tympanites is often distressing or even dangerous. The remedies usually first tried are hot stimulating applications to the abdomen and turpentine enemata. If these are not sufficient the old-fashioned enema of molasses and milk (one ounce in three of warm milk) is often of great use. Lately digitalis has been employed for this condition, large doses being given by the bowel. It acts in some obscure way and is a good example of rational empiricism. Shier (6) recommends that after all abdominal operations the patient should be given two drachms of the concentrated tincture, corresponding to an ounce of the B. P. tincture, in the Murphy drip as a prophylactic measure. As will be noted a little later this may also lessen the chances of respiratory complications. If the meteorism persist, pituitrin, 1 c.c. hypodermically, may be used. It acts by directly stimulating non-striped muscle, in this way differing from adrenalin which produces its effects through the nerve endings. It is well to remember, however, that both of these bodies tend to raise the blood pressure and may thus strain a flabby heart. Moynihan speaks of a patient of this sort who died within a few minutes after a usual dose of pituitrin. Eserine sulphate is also used in doses of 1/100 to 1/50 gr. hypodermically. It acts on both nerves and muscle.

I have said nothing about respiratory complications following these operations, but it will be remembered that massive collapse of the lung is specially apt to happen after operations in the upper zone of the abdomen. As regards bronchitis, pneumonia and oedema of the lungs it is interesting to note for what it is worth that Felix Mandl (7) found that the intramuscular injection of digipuratum at the time of operation reduced respiratory complications to less than one half. A very common respiratory complication is pulmonary embolism and infarct.

Such are a few thoughts that have occurred to me in connection with the subject. I would end by repeating my belief that although the responsibility for the after care of abdominal operative cases should be in the hands of the surgeon, still the physician can often be of use and should be asked to freely share the care of cases in which complications arise which are amenable to medical treatment.

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INFANTILE ECZEMA*

HOWARD SPOHN, M.B.

Vancouver, B. C.

ECZEMA, the most common skin disease of infancy, is intimately associated with disturbed metabolism in a group of individuals exhibiting a peculiar pre-disposition towards certain manifestations. These manifestations show often in early infancy in the form of eczema, associated with catarrhal conditions of the respiratory tract, such as naso-pharyngitis, bronchitis, and later on asthma. This predisposition is congenital and often hereditary, as shown by careful enquiry into the family history in these cases.

In the earlier writings eczema was described as linked with, or even a part of the scrofulous group. The individuals comprising this group exhibited frequently symptoms of a tubercular nature, and so in earlier times, eczematous infants were often spoken of as having a tuberculous tendency. This conception for many years clouded the medical vision, but since Czerny (1) designated certain symptoms or manifestations as belonging to the "Exudative Diatheses Group" we have a somewhat clearer understanding of a complex condition.

Leo Wolf (2) in a review points out that the idea of the diathesis is very old, having played a prominent role in the medicine of Ancient Greece, especially the school of Galenus. Today we still use such terms as the tuberculous, the arthritic, or the lymphatic diathesis, and these conditions all point to Adlers theory of organic inferiority. This existence of a constitutional defect makes possible in the exudative group, for example, the exhibitions of the well-known chain of eczema, bronchitis, asthma, etc.

The skin manifestations in the exudative group may be, as to location, limited or extensive, and may vary as to severity, from a mild seborrhaic eczema to a severe infiltration of the tissues with extensive excoriation. The varied forms are too familiar to warrant any elaborate classification. The most frequent locations are the face, scalp and arms.

The symptoms generally occur early in the life of the infant and are seen usually in fat, well nourished infants and also, to a more limited extent, in the undernourished. As far as the skin manifestations are concerned, there is a decided tendency to clear up or subside about the end of the second year of life. During the course of the disease much nutritional disturbance takes place, but fortunately, early and proper treatment shortens the course of the disease, eliminates much physical discomfort, protects the nutrition, and may influence the appearance and severity of the more serious associated conditions which follow later.

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A great many causes have been mentioned in regard to eczema. Eppinger and Hess believe that it is a form of vagotonia, the manifestations being due to an increased tone in the vagus system. In support of this Leopold (3) published his results in eczema in a series of cases treated with Atropin in increasing doses. He claims good results from this treatment even with no changes in diet. Blackfan (4) and Schloss (5) emphasize the apparent disturbance in protein metabolism and Blackfan (4) infers that the condition is chiefly due to absorption of foreign protein as demonstrated in a series of protein skin reactions in eczematous and non-eczematous individuals. As far back as 1882 Henoch in his book makes note of the hereditary tendency and mentions the condition as associated with nutritional disturbances due to the high fat content of mothers' milk. Holt notes the occurrence of the conditions in fat, healthy looking infants on breast milk. Czerny defines the exudative diathesis as "a change in the chemistry of the organism which is caused by a congenitally low tolerance of the organism to fat." Finklestein and Meyer think the changes are due to altered metabolism of the salts. Bernis and Kern look on the change in the nitrogen metabolism as characteristic. Kern found that children with exudative diathesis have a delayed excretion of uric acid. There is also strong evidence that either too high sugar content, or too high sugar concentration, are in some instances apparent causes, and in nearly every case of florid eczema, sugar, (i.e., soluble carbohydrate) has an irritating effect during the course of the disease. Czerny noticed a close connection between exudative and neuropathic tendencies in these infants. A careful survey of the family history will, he thinks, often reveal severe neuroses in the parents. Birk thinks the neurotic tendency explains the genesis of diarrhoea or constipation in the breast fed infants of this type. These symptoms arise from an intestinal irritation too insignificant to produce symptoms in a normal child. The neurosis accounts for abnormal skin reactions in these children and hence the eczematous child will continue to scratch and tear at himself until the blood comes. The geographic tongue has been looked upon by some writers—including Czerny—as an indication of exudative diathesis. This has been an infrequent occurrence in cases I have seen. The close connection between the eczematous affection of the skin, and the affections of the air passages as naso-pharyngitis, bronchitis and asthma is now generally recognized. (The series I have tabulated demonstrates this connection rather forcibly. Naso-pharyngitis occurs frequently and commences early in life. There is usually a slight temperature with these re-occurring attacks and, due to the repeated infection, the post-lymph glands become chronically enlarged. Otitis media is, of course, not uncommon. In some children of this type bronchitis is the predominating feature. In these children later in childhood we often see asthmatic attacks. In this type of case there is often enlargement of the lymphoid organs—the spleen, thymus, tonsil and intestinal follicles Czerny regards the changes in these organs as secondary to the pathologic changes in the skin and mucous membranes. The hypertrophy he regards as due to over feeding, which favors the deposit of fat.

It is well known that diarrhoea and infections such as pneumonia, cystitis, etc., often produce marked improvement in the exudative skin condition.

Confronted by these rather different views as to the cause of the condition it seemed that some useful deductions might be made from a clinical review of a successive number of cases occurring in private practice. I have therefore tabulated a number of cases in which a complete history was kept and where opportunity was given to observe the cases over a fairly extended period of time. The frequent food idiocyncrasies seen in eczema, bronchitis and asthma have led me to include a few cases not showing eczema, but exhibiting other features common to the exudative diathesis.

These cases seem to group themselves in three classes

(1).—Infants developing eczema on breast milk (high fat)..

(2).—Infants developing eczema on cow's milk mixtures and sugar.

(3).—Older children developing eczema on mixed feeding.

In the latter class the eczema is usually associated with a history of over feeding with gross errors in one element such as high carbo-hydrate (in the form of jam, preserves, candy, etc.) May we not gain some information from this grouping and is it not logical to assume that eczema is an evidence of disturbed metabolism of one or more food elements? The high fat breast fed infants form the most common class and in the second class we get better results from the use of skimmed milk, so that we are justified in assuming that a deranged fat metabolism is the most frequent and definite factor in causation. Two types are present in the fat disturbance cases. First, those infants who gain very quickly and in whom the severity of the eczema corresponds with the rapid gain in weight. This type of infant becomes flabby and has not the feel of a normal well nourished plump infant, and is pasty in color. The second type of child remains stationary even on properly adjusted food. These children if on breast milk are often weaned, and then it is discovered, too late, that they do even worse on cow's milk dilutions. Increase of quantity of food produces no benefit, and, in these cases, we should recognize early that it is not the kind of food, but a congenital metabolic defect in the infant that makes the condition possible.

There can be no doubt that the protein skin tests furnish much information and definite indications in regard to treatment. That a disturbed protein metabolism is the original or congenital causative factor does not to me appear to be proved by any work already done. Blackfan (4) obtained twenty-two positive (cutaneous or intracutaneous) reactions in twenty-seven eczema infants. Positive reactions were obtained in only one instance in a series of forty-three patients with no history of eczema. In three of my cases M. R. and B. W. and T. G., I obtained positive reactions in patients without eczema, but with associated symptoms of head colds, bronchitis, etc., and in one case a family history of asthma. In one other non-eczematous patient with bronchitis the skin tests were negative, although there was a definite history of intolerance to egg white which was still persistent at eleven years. Clinically great improvement is brought about by the elimination of the proteins giving positive tests, but on the other hand a great mass of clinical evidence points to an early fat intolerance. Some cases in the breast fed, i.e., high fat feeding, clear up with high protein food (i.e. protein milk) as a supplement. In practically all cases we meet this intolerance to fat and so well recognized is this feature that practically all cases are at once given a low fat food. The suggestion has been made that as in diabetes we have a mixed disturbance of carbohydrate and fat metabolism, so in eczema we have probably a congenital fat disturbance which brings about a disturbance of the protein and carbo-hydrate mechanism. Dr. Coleman and I hope to continue some work along this line.

The existence of sensitization in the breast fed child is suggestive and we meet cases in which infants are sensitized to proteins which they have never digested. O'Keefe (6) reports a case, breast fed, sensitized to cow's milk casein, in which he obtained complete relief in two weeks from cutting down the cow's milk in the maternal diet. This child showed a relapse at five months when weaned and put on cow's milk. Another case, breast fed, was sensitized to oat and egg protein. The mother was found to be taking a large amount of oatmeal and several eggs a day. The eczema cleared on reducing these elements to a minimum. Case 2 (D.D.) of my series is a similar case.

PROTEIN REACTIONS IN ECZEMA CASES

TABLE 1

Case	Age of Onset	Distribution	Reaction	Assoc. Symptoms.	Result
1.—S. G. (M)	1 mo.	Face, shoulders, trunk and lower extremities	Lactalb + Barley + Wheat + + + Ragweed + Timothy +	Eczema, 1 mo. Bronchitis, 2 yrs. Asthma 2½ yrs.	Eczema cleared at 2 yrs. Asthma improved.
2.—D. D. (M)	7 wks.	Face, scalp, arms	Eggwhite + Oat +		Cured at 10 mos.
* 3.—P. H. (F)	5 wks.	Face, trunk, extremities.	Eggwhite + + + Oat + + Wheat +	Bronchitis 3 mos. Cylic vomiting 12 mos. to 2 yrs. Asthma 8 yrs.	Eczema clear. Asthma unimproved.
* 4.—W. H. (M)	5 wks.	Scalp, face and chest	Wheat + + + Oat + + Cow's milk +		Cleared in 4 wks.
5.—E. B. (F)	4½ mos.	Face, arms.	Oat + + Barley +		Cleared in 2½ mos.
6.—S. E. (M)	10 days.	Face, scalp, trunk, extremities.	Eggwhite +	Bronchitis, Head colds.	Cleared quickly.

PROTEIN REACTION IN ECZEMA CASES—*Continued*

7.—W. I. (M)	3½ mos	Face, scalp, trunk	Eggwhite++ Wheat++ Timothy+ Ragweed+	Head colds 1st yr. Bronchitis 1st yr. Asthma at 4 yrs.	Eczema cleared. Asthma relieved.
8.—D. S. (M)	3 wks.	Face, scalp, trunk, extremities.	Eggwhite+ Barley+ Wheat+	Eczema, 3 wks. Bronch. since 2 yrs. Asthma 5 years.	Eczema cleared quickly, Asthma less marked.
* 9.—F. F. (M)	5 wks.	Face, scalp, trunk, extremities.	Negative to usual protein tests.		Eczema cleared rapidly in 5 wks.
*10.—M. F. (F)	7 mos.	Face, scalp, arms.	Eggwhite +++ Oat+	Intolerance for cow's milk to 2 yrs. Egg causes upset.	Eczema cleared quickly after 5 mos.
11.—A. S. (F)	16 mos.	Both extremities.	Cow's milk ++ Eggwhite+ Oat+ Wheat+	Bronchitis. Enlarged T. and A.	Improved slowly.
12.—N. W. (F)	4 mos.	Face, scalp, trunk.	Eggwhite+ Wheat+ Oat+		Cleared quickly.
13.—K. Mc. (F)	5 mos.	Face, trunk, extremities.	Lactalb+ Oat+ Eggwhite+ Cows' milk+ Barley+	Bronchitis, Head Colds.	Clear after 10 mos. treatment.
14.—B. N. (F)	3 mos.	Face, trunk, extremities.	Lactalb+ Oat+ Barley+ Eggwhite+		Clear in 6 mos.
15.—E. D. (F)	6 mos	Trunk	Cows' milk+		Cleared slowly.
16.—A. C. (F)	2 mos.	Face, scalp, trunk, extremities.	Eggwhite +++ Cows' milk++ Oat+ Barley++	Bronch. 1st year Head colds 1st yr. Asthma at 2 yrs.	Improved slowly.
17.—W. T. (M)	9 mos.	Face, scalp, trunk.	Wheat++ Eggwhite+ Barley+ Cows' milk+	Head colds	Much improved in 4 mos
18.—L. P. (M)	11 mos.	Face, scalp.	Oat+ Wheat+ Chicken+	Bronchitis. Cylic vomiting.	Cured quickly.
19.—R. S. (F)	11 mos	Face, thighs.	Eggwhite+ Oat++ Wheat+		Cleared quickly, 1 mo.
20.—M. A. (F)	11 mos.	Face, Arms.	Eggwhite+ Oat+		Improving.
21.—M. R. (M)	18 mos.	Skin clear	Eggwhite+ Wheat+	Bronchitis Head colds. Upset with egg.	No upset with no-egg diet.
22.—B. W. (F)	18 mos.	Skin clear.	Eggwhite+ Cows' milk+ Wheat+ Oat+	Head colds. Bronchitis. Vomiting after cows' milk or egg.	Bronchitis improved with no egg and boiled cows' milk.
23.—T. G. (M)	7 mos.	Skin clear	Cows' milk+	Frequent head colds. Collapse after cows' milk feeding.	Tolerance for cows' milk established in 5 mos.

*Brothers and Sisters.

My series consists of seventy successive cases of well defined eczema. Twenty-two (*Table I*) of these cases were tested with the various proteins: lactalbumin, cow's milk, egg white, barley, oat, wheat, etc. Only three of these cases failed to give positive tests to one or more of the proteins, i.e., 80% of tested cases gave positive results. Unfortunately all the cases were not tested, so that it is impossible to state the percentage of the whole series. In these twenty-two cases tested, fourteen reacted to egg white, thirteen to oat, ten to wheat, seven to barley, six to cow's milk, and three to lactalbumin. In eight cases there was a definite history of marked upset, vomiting, prostration or bronchial asthma after the ingestion of small amounts of egg. In all these cases the protein skin test for egg white was positive. The case of W. Irwin is typical.

This case, W. I., was breast fed for ten months. At three and a half months he had developed marked eczema of the scalp, face, body and arms. Various kinds of ointments were advised by a skin specialist with no relief. No dietetic treatment was tried. At ten months he was put on a plain milk and water mixture with sugar and at twelve months cereals, broths, etc., were added to his diet. The eczema showed no improvement until he was two years of age and it occurred at various periods until he was over three years of age. Since this time he has been free of eczema except for a few mild attacks. At eighteen months of age he was given a custard containing egg and vomited at once. His mother did not realize at first that the egg was responsible for the vomiting and a short time afterwards he was given a soft egg. He immediately became very ill, vomiting occurred within two minutes with coryza and a choking sensation. His mother then omitted egg from his diet. A few times he had plain cake containing eggs and immediately became ill (vomiting, coryza and slight wheezing). At one time he dipped his finger in the meringue of a pie and took in quantity not more than half a teaspoonful of this. There was vomiting, etc., at once. During the first two years of life he had frequent bronchial attacks associated with vomiting and constipation. At four years of age he had a definite attack of asthma. I saw him six months later during another definite asthmatic attack. He was tested out by giving him strawberries, raspberries and raw apples. They produced no reaction. Ordinary bread caused no upset, but wheat flakes produced, slight upset. His protein skin reactions were as follows: Egg white, positive; lactalbumin, positive; wheat, positive. Barley, oat, and casein, negative. At present oatmeal, in moderate quantities produces no reaction; cheese, butter and bacon can also be taken.

He was put upon a no egg, no wheat, diet with skimmed milk. His tonsils and adenoids were removed and he was sent to the country after the operation. There he was exposed to timothy pollen and had a very bad attack of asthma. He returned to the city looking very pale and worn and with a marked bronchitis. He reacted to timothy and ragweed and was given increasing doses of vaccine over a period of five weeks. After four weeks his condition improved rapidly, he gained in weight, and had no return of the asthma for five or six months. During the course of the next year he had several bronchial attacks, but no definite asthma. This case is quoted in detail because it shows the association between early eczema and asthma in a typical manner.

In one of the eczema cases there was marked shock within five minutes of the administration of 1,000 units of antitoxin. Similar cases have been reported and there is no doubt that anaphylactic shock, with even fatal results, may follow the administration of horse serum. All eczema cases should be carefully tested with minute doses of serum given at two hour intervals before administering the usual prophylactic doses.

The series of cases consists of 33 breast fed (47%), 22 (31%) fed on cow's milk and sugar, and 15 or (21%) on mixed feedings, with cow's milk. This last class did not develop eczema on cow's milk alone.

Eczematous children usually give a history of either constipation or loose green stools with fat curds. In this series 38 or (54%) were constipated. These children will usually eat too eagerly. In 43 or (61%) of this series there is a history of an eager or good appetite. In 39% there was a definite family history of either eczema, persistent head colds, bronchitis or asthma. These children are usually well nourished, a small proportion being under weight. In this series 57% were over weight or normal in weight. Too frequent feeding interval is especially harmful in eczema cases. In 70% of the breast fed of this series there was a history of being fed every three hours or oftener. If the normal breast fed baby does so much better on the four hour interval, it is especially necessary to have a sufficient interval in this type of infant with a weakened tolerance for fat. In 63% of this series there was a definite history of fat intolerance. Of course it cannot be stated that the fat was the initial cause of the eczema, but the high percentage is very suggestive.

There seems to be some close connection between eczema and carbohydrate metabolism. It is a well known fact that we can substitute a 4 to 5% insoluble carbo-hydrate for a 4 to 5% soluble carbohydrate and obtain great improvement in symptoms. This is so well recognized that many pediatricians immediately eliminate all sugars and substitute starch in the feedings. In this series this procedure was followed, the form of starch being Imperial Granum or prepared Barley Flour. In 56% of the series sugar had an irritating effect on the skin condition. In many cases the mother noticed this and nearly all my cases were tested by adding sugar during the course of treatment. Dr. Coleman has suggested that the improvement with the starch is probably explained by the increased time needed to allow absorption of the starch on account of hydrolysis. The carbohydrate concentration may play an important part in the treatment of this condition.

Clinically, orange juice seems to increase the skin irritation and I have stopped the orange juice in all cases, until the skin was clear.

There seems to be no doubt that the fat in preparations such as Evaporated Milk is more easily handled than the fat of cow's milk. On this account I have used this preparation in all the very extensive eczemas and also because the irritating proteid of the cow's milk (in this preparation) is destroyed with the high heat used in its preparation, hence we get excellent results in the cases where cow's milk protein causes irritation. In mild cases boiling the skimmed milk is sufficient.

Dietotherapy and local treatment meets generally with a quick response. There is often alleviation of symptoms in three days and much improvement in a week. In my series 65% were clear of eczema in less than three months and remained clear if they adhered to treatment. Twenty-four percent took from 3 months to 9 months to become clear, i.e., 89% were able to keep clear of eczema. In all these cases the eczema would, I think, have returned on the original diet. Three cases showed only slight improvement. Four cases, developing eczema on breast milk cleared by giving protein or Larosan Milk before each nursing.

Routine Treatment

The plan adopted in all severe cases is as follow:

1.—Make protein skin tests, using Arlington Chemical Co., prepared proteins.

2.—Put on Evaporated Milk or boiled skimmed milk. (In the breast fed reduce the intake of fat by giving barley water or protein milk before nursing).

3.—Substitute starch for sugar.

4.—Eliminate all raw fruit or fruit juice, such as orange juice.

These children can usually be given enough fat soluble vitamine in Cod Liver Oil to protect from Rickets. After the severe symptoms have subsided some cases can be given orange juice or in some cases such preparations as Dryco Milk seem to contain enough anti-scorbutic vitamine to protect over the period of treatment.

5.—Local treatment, i.e., external therapy.

The external therapy consists in using olive oil in place of water for cleansing; and the use of local applications such as tar and resorcin ointments. No beneficial results from local treatment can be obtained without the very active co-operation of the nurse or mother. The child must be kept from scratching. This means that the arms must be put in restrainers and the hands in linen mitts or aluminum mitts. The arms should be loosely fastened so that the child is comfortable, but cannot scratch. In severe cases it is generally necessary to keep the child quiet by the use of a comfortable fitting straight jacket. (The legs should be kept apart if affected, so that they cannot be rubbed together). Quartz light therapy has been tried in several cases but we have so far seen no permanent improvement.

In the majority of cases in infants, after the scales or crusts have been removed with oil, I have used 30-50% tar ointment with 1% salicylic acid. In some cases this is too irritating and more bland applications are advisable. For the scalp a 4% resorcin ointment is usually effectual. After the severe symptoms are over any bland oily substance will suffice.

Conclusions

1.—Eczema is a disease due to a congenital metabolic defect. Dietotherapy is therefore the important treatment.

2.—Fat intolerance is the most frequent cause. Protein and carbohydrate disturbances are usually present—probably as a result of the fat disturbance.

3.—Protein skin tests furnish much information and are present practically only in exudative diathesis cases.

4.—The association between eczema and affections of the air passages is definite.

5.—There is a family tendency to exudative diathesis.

6.—Local treatment gives great comfort and hastens the cure.

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EXANTHEM SUBITUM—REPORT OF FIVE CASES

Alton Goldbloom, M.D.

Montreal

Baby F., 15 months of age, a child of healthy parents, took ill in January of this year with continuous fever, 103, and restlessness. Physical examination at that time revealed nothing of importance except a very mild injection of the pharynx. The ear drums were normal and nothing could be found in the thorax to explain the temperature. I considered this to be an attack of naso-pharyngitis which was quite common at that time of the year. The temperature continued with little remission for three days and fell rapidly to normal on the morning of the fourth day. On this day the mother reported to me by telephone that while the child seemed well again in every respect, he had broken out in a profuse rash which covered his entire body. Upon examining him I found the temperature 98, the throat normal and the child bright and playful. He had, however, as the mother described, a rash which was maculo-papular in type, the lesions varying in diameter from 2 to 5 mm. They faded out on pressure, they were nowhere haemorrhagic and did not present the crescentic forms common to measles. The rash was of a pale rose color, was most marked on the trunk and abdomen and present to a lesser degree on the arms, legs, neck and face. It did not appear to be itchy. The eruption lasted about thirty-six hours, after which it faded with very faint desquamation.

This case serves as a typical example and is one of a series of five similar cases which have come under my observation within the past year. The onset, the symptoms, the course and the outcome are strikingly similar in all of these cases. In no way have any of these cases presented the characteristics of any of the well known exanthems and one is forced to the conclusion that here is a new and generally unrecognized disease.

Of my five cases, two were in girls and three in boys. The ages varied between nine and fifteen months. In no instance was it possible to trace the disease to a previous case, nor were there any cases resulting from contact with these children.

The onset was abrupt in all the instances, the temperature varying between 101 in the mildest case and 105.3 in the most severe one. In one, the onset was ushered in by a sharp convulsion In all, the temperature was sustained with very slight remission of not more than one degree in the twenty-four hours, until it fell by crisis, which occurred on the fourth day in four of my cases, and on the morning of the fifth day in the child whose onset was with the convulsion. In each case the crisis was coincident with the appearance of the rash. The eruption was quite characteristic in all the cases, morbilliform in type, macules and maculo-papules, 2 to 5 mm. in diameter, fading out on pressure and not itchy. The greatest distribution was from the lower part of the face to the pelvis, the lesions in the extremities, face and head being more scattered. However profuse the rash appeared in any part of the body, the skin between the lesions presented its normal appearance. Coalescence was not present in any of my cases, although it is mentioned by other observers. No enanthem was observed and no glandular enlargement. In only two of my cases was faint desquamation seen. There were no complications. This series does not seem to have any seasonal incidence. Of my five cases the first occurred in November, 1920, the second in November 1921, the third in January 1922, the fourth in February 1922 and the fifth in April of this year.

What is probably the earliest description of this disease was published in 1910 by Zahorsky, of St. Louis, who called it Roseola Infantilis. In 1913 he reported a series of thirty-five cases under the name of Roseola Infantum. The onset and course of Zahorsky's syndrome bear a detailed resemblance to the syndrome I have just described More recently Levy described the same syndrome and also expressed the belief that it was a new eruptive fever quite distinct from any of the well known diseases. Veeder and Hempelmann reported a series of eight cases which were studied in detail and mentioned more than twenty that have been observed by them. They expressed the belief that they were "dealing with a definite clinical entity not recognized in any of the present text books." They suggested the name of Exanthem Subitum as being "descriptive of the most striking clinical symptom, namely, the sudden unexpected appearance of the eruption on the fourth day."

Greenthal reported eight cases in Ann Arbor in January of this year with practically the same clinical symptom complex.

Briefly the chief characteristics of the disease are these:

1.—The age of the patient; between nine months and two years in all the cases so far reported except in one instance where the patient was five years of age.

2.—The symptoms; characterized by sudden onset, irritability and sustained high temperature for three or four days with nothing in the physical examination to account for it except a very slight injection of the pharynx.

7.—The blood picture; studied by Veeder and Hempelmann and characterized by a leukopenia, 5 to 7,000 with a relative lymphocytosis.

4.—The characteristic eruption; occurring with defervescence on the fourth or fifth day, commencing on the face and spreading rapidly over the entire body, maculo-papular in type, pale rose red in color, with its greatest intensity on the trunk and abdomen and fading in two or three days, followed by a very faint desquamation.

5.—The apparent absence of contagion. This has been noted by all who have so far written on the disease. In my own series, too, no instance of contagion was noted.

6.—The absence of complications or sequellae. The differential diagnosis offers little if any difficulty, in view of the unusual course of the disease. There is no other exanthem in which the eruption is consistently coincident with defervescence and with the disappearance of all signs of illness.

CONCLUSIONS

"Exanthem Subitum" is a new febrile exanthem presenting a distinctive clinical syndrome and a characteristic eruption. It is apparently non contagious, is of unknown etiology, affects chiefly infants, does not occur in epidemics, and is without complication or sequellae.

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FORMOL-GEL REACTION IN THE BLOOD SERUM OF SYPHILITICS*

C. A. Watson, M.D.

Montreal

IN the *C. R. de la Soc. de Biol.* of November, 1920, there appeared an article by Gaté and Papacostas in which was presented a new and very simple technique for the examination of serum in cases of syphilis or suspected syphilis. Because the technique is so very easy to carry out a great saving in time would be effected if the test is an efficient one. If the results can be relied upon the test would be suitable for practitioners, even those without the advantages of a laboratory.

In the original article there was a report upon the examination of over 400 cases; the results showed that the "formol-gel" test corresponded with the Wassermann reaction in 85% of the cases. The technique employed was as follows: In a test tube was placed 1 cc. of very clear serum and two drops of commercial formalin. This was shaken to assure mixing, plugged with cotton and left at the temperature of the laboratory for a time varying from 24-30 hours. They came to the following conclusions:—

1.—Previous inactivation of the sera is not necessary. The reaction is produced in certain sera whether it is inactivated or not. 2.—The reaction is obtained as easily with sera 48 hours or even several days old as with fresh sera. It is necessary that the sera should not have been contaminated. 3.—Incubation does not modify the reaction. 4.—"Relating to the possible comparison between the "formol reaction and the Bordet Wassermann, we have observed "the following facts:—

"A mixture of several sera positive to the Wassermann, gives a positive formol reaction in 100% of cases.

"A mixture of several sera negative to the Wassermann, gives a negative formol reaction in 100% of cases.

"For sera taken singly and submitted to the two reactions, we find between them, whether they give positive or negative reactions, an agreement in 85% of cases."

Since the publication of the original article referred to above, several letters have appeared in the literature on the subject. One of these, is written by J. Mackenzie to the *British Medical Journal* of June 11, 1921. In it, among other conclusions, he states,—"It would be premature to form any definite opinion from such a small series of tests (25), but the results obtained are sufficiently striking to show the potentialities of the method, and to give rise to the hope that this rival of the Wassermann test may lead to a simple and reliable method of diagnosing syphilis."

Since that time numerous contributions have been made to the same Journal. None of them places any reliance upon the results obtained. In fact, it appears in most cases that no reaction took place. It might be pointed out, however, that no reference is made by these contributors to the kind of formalin used in their tests. We would judge that at least one of those who obtained unsatisfactory results employed chemically pure formalin. It is necessary that commercial formalin be employed.

This communication records the examination of a comparatively large number of sera (201). All of these tests were controlled by the Wassermann reaction. Eighty-seven of them, whose clinical histories were readily available, were further analysed. The technique employed was as follows: From .5-1cc. of the serum to be tested was placed in a flat-bottomed test tube having a diameter of ¼ of an inch. Two drops of commercial formalin per cc. of serum were added. The tube was then shaken to thoroughly mix the contents, and was stoppered with a pledget of absorbent cotton. After standing for 24 hours at room temperature, the reactions were read by comparing the viscosity of the treated serum with that exhibited by a control tube. The viscosity of sera giving a positive reaction varied from a semi-fluidity to a firm gelification. In a few cases this was so marked that the gel could be removed from the vial only with the aid of some instrument. On the other hand, those sera giving a negative reaction remained perfectly fluid. None of the 201 cases was selected, but all were taken as they came to the Genito-Urinary Outdoor Department of the Montreal General Hospital under Doctor F. S. Patch. All of the tests were made on the same day that the Wassermanns were done. None of the 87 cases which were further analysed, were specially selected.

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*From the Pathological Laboratory, the Montreal General Hospital.

The analysis of the 87 cases whose clinical histories were obtained, showed that the age of the patients ranged from 6 months to 47 years, the average being 27 years. Of the 87, 53 were males and 34 were females. A clinical diagnosis of syphilis in its different forms was made in 62 of the 87 cases analysed. The diagnosis depended on the presence and character of the following lesions (in conjunction with the Wassermann reaction).

Primary Sore	15
Rash and Mucous Patches	26
Sore and Rash	2
History of Sore	20
History of Rash	9
Husband or Wife Syphilitic	12
Ulcers on the Legs	5
Gonorrhoea	7
Not definitely diagnosed clinically	25

Treatment—43 cases had not received any form of antisyphilitic treatment when submitted to the two reactions (Wassermann and Formol-Gel). The remaining 44 had received intensive courses of diarsenol and mercury for periods ranging from one month to six years, as follows:

Treated for 1 month	4 cases
“ “ 3 “	2 cases
“ “ 4 “	2 cases
“ “ 5 “	1 case
“ “ 8 “	2 cases
“ “ 1 year	10 “
“ “ 2 years	11 “
“ “ 3 “	2 “
“ “ 4 “	3 “
“ “ 5 “	2 “
“ “ 6 “	1 case
Exact length of treatment unknown	4 cases

Results

As the result of our investigation, we have obtained the following results:

Of the 114 unanalysed cases, there was an agreement between the Wassermann and formol-gel reactions in 74 cases, or 65%.

Of the 87 analysed cases there was an agreement in 60 of them, or 65%.

With the technique employed we are of the opinion that the "formol-gel" test is not as reliable as the Wassermann reaction.

THE CLINICAL DIAGNOSIS OF SYPHILIS*

H. A. Dixon, M.B.

Clinician in Medicine, University of Toronto

THE cutaneous manifestations of syphilis are possibly the most striking features of the disease, yet they constitute only one phase in a general process involving all systems.

In this description only the skin lesions will be dealt with.

It is customary to divide the course of syphilis into the periods of primary, secondary and tertiary.

In the primary period, the initial lesion which occurs at the site of inoculation with the spirochaeta, appears about twenty-six days after the inoculation, and is associated soon after with swelling and induration of the neighbouring lymphatic glands which drain the sore.

The secondary period manifests itself by cutaneous eruptions which are seen about forty-five days after the development of the primary sore and are usually associated with a febrile disturbance.

The tertiary period is characterized by lesions of a more chronic type, not so widely nor so symmetrically distributed. They may appear two or three years after the commencement of the secondary period or after a latent period of indefinite duration during which no distinct evidences of the disease are present. The chancre varies greatly in appearance, but, most commonly, it is found as a flat erosion, circular or oval, from ¼ to ½ inch in diameter, deep red in colour at first but later assuming a grayish tint and either moist or covered with a thin grey membrane. After a few days, the lesion becomes raised and hard, and when pinched, feels like a disc of paper, a nodule of cartilage or a hard ring. Though slightly itchy at first, it is associated with no definite pain. In this condition it remains for three or four weeks, heals spontaneously and leaves a brownish indurated scar which gradually disappears unless definite ulceration has taken place in which case a permanent cicatrix may result.

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*Read before Section of Medicine, Academy of Medicine, Toronto, Oct. 11th, 1921

Varying from this type of lesion, the chancre may occur as a simple abrasion situated on an indurated or non-indurated base, or from secondary inoculation with pyogenic organisms or the action of irritating discharges behind a tight prepuce, the chancre may become acutely inflamed and associated with much oedema: again, in debilitated subjects, such as diabetics, the secondary inoculation with pus organisms may lead to gangrene, necrosis of the chancre and the formation of a deep phagedenic ulcer.

Occasionally, Ducrey's bacillus of soft sore may be introduced at the same time as the syphilitic virus, with the result that the sore begins on an inflammatory base covered with a purulent discharge; this later becomes indurated and takes on the characteristics of a chancre.

In some cases two or more chancres are present as the result of several inoculations taking place at the same time, from the presence of several abrasions, or as a result of a series of inoculations occurring at intervals of a few days.

Another uncommon type is the relapsing chancre. It may appear a few weeks after the original lesion has healed or several years later. The induration entirely disappears, but, on reappearance, takes the form of the original chancre in extent and character or by softening, may suggest a breaking down gumma.

With regard to the situation of the initial lesion; in the male two-thirds of them are found on the mucous membrane of the prepuce, in or behind the corona, or on the surface of the glans penis: when it occurs in the urethra, near the meatus, both lips are generally affected giving rise to marked induration and oedema.

The lesions on the penis, with which a chancre is most liable to be confused, are soft sore, herpes and scabies. Points of distinction are as follows: The incubation period of a soft sore is a few hours to several days like an ordinary impetigo; soft sores are generally multiple, deep and punched out, irregular in outline, soft, readily autoinoculable, and the neighbouring glands become inflamed, painful, and are liable to suppurate: finally, the discharge contains the bacillus of Ducrey.

Herpes is not infrequent on the penis and labia, but there is no induration therewith and the erosion which follows the vesicles tends to be polycylic in outline.

In scabies the lesions are usually multiple—occurring as round indurated red spots or small excoriations covered with scales, occasionally a typical burrow is seen, and there are evidences of the disease in the usual sites. Just in point, I remember a patient overseas who was allowed to go on leave with an unhealed scabetic lesion on the penis, and, shortly after his return to hospital, a chancre appeared in the abraded surface.

Extragenital chancres are most common on the lips, in the mouth, on the fingers and face, but may be found on the tongue, tonsil, in the nose, on the eye or within the anus. In three years at the London Hospital, Whitechapel, Dr. Sequeira had (80) eighty cases of extragenital chancre, (42) forty-two in the female and (38) thirty-eight in the male. They were slightly more common on the lower lip than the upper. Two unusual sites were the umbilicus and the palmar surface of the right hand—the latter occurred in a bus driver, and appeared to have been contracted by passing the hand along the railing leading to the top of the bus.

On the lip, the lesion may consist of a fissure, an erosion or an elevated ulcer with indurated edges, and covered with a brown scab. The lip becomes swollen, and the glands beneath the chin enlarged and hard. An epithelioma of the lip evolves more slowly, is more irregular in outline, occurs after middle life, and the neighbouring glands, if enlarged, do not become so for five or six months.

On the tongue, the chancre is usually found on the dorsal surface, in the anterior part as a simple erosion with an indurated base, a deep ulcer or a sclerotic mass, and associated with enlarged, indurated, submaxillary glands. A carious tooth will give rise to a more painful ulcer at the side of the tongue.

Chancre of the beard region might be mistaken for trichophytic sycosis, but the enlargement of glands and the absence of fungus, would establish a diagnosis.

On the nipple it is distinguished from a simple fissure by the induration, absence of pain and by the enlarged; painful axillary glands.

On the finger, the inoculation usually takes place through an abrasion, but it has been known to occur on an eczematous patch or a broken chilblain. The common site is about the finger nail, where it gives rise to a painful, irregular ulcer or to a fissure with indurated edges, or it may resemble a whitlow, causing the end of the finger to be red, hard and swollen. The epitrochlear and axillary glands are enlarged.

A chancre within the anal orifice is deep red in colour, usually oval, not markedly indurated and the inguinal glands are enlarged. Tuberculous ulcers in this area are more yellow and have better defined borders. Anal fissures are distinguished by being more painful and not associated with enlarged glands.

To go now from the chancre to the cutaneous syphilides. These lesions have certain characteristics which are common to the majority of them and serve to distinguish them from other skin affections. The disease has been described as the "great imitator," and practically every form of primary and secondary cutaneous lesion may be simulated by a syphilide—for example one case may be papular suggesting lichen planus, another pustular resembling a bromide eruption, another scaly like psoriasis, circinate like seborrhœic dermatitis or papulo-pustular like acne vulgaris.

The majority of syphilides have a peculiar "copper" or raw ham tint, with the exception of the early roseola and pigmented lesions, they are indurated; the early forms come out rapidly and disappear rapidly—the late form develops slowly and remains indefinitely. The late forms usually remain discrete, but may coalesce to form circles, segments of circles or serpiginous figures. The early eruptions are usually symmetrically distributed; involve the face, trunk, and flexor aspects of the limbs. The late lesions are grouped asymmetrically. Sensory symptoms are absent in cutaneous syphilides except when irritated by friction or associated with seborrhoeic dermatitis. And finally, they improve rapidly with salvarsan or mercury, while local treatment has little or no effect on them.

For purposes of description, the cutaneous syphilides are classed as early, intermediary and late. In the early group are the roseola, pigmentary and widely distributed eruptions which are usually papular, but may be scaly, vesicular or pustular. The intermediary lesions consist of those on the palms and soles, and papules arranged in rings, or clusters about a large central papule. The late syphilides consist of those which are ulcerative or gummatous in type.

The macules of the early eruption are round, oval or blotchy, about the size of a split pea, and may suggest the flush of scarlet fever. In association, there is painless enlargement of the lymphatic glands, pain in the head—most marked at night, pain in the limbs, sore throat, albuminuria and a rise of temperature with evening exacerbations. The early syphilide must be distinguished from a toxic eruption of the erythema multiforme type. In the latter the lesions are present chiefly on the face, the backs of the hands, the wrists and the fronts of the legs, are darker in colour and remain discrete. Drug eruptions such as produced by copaiba and antipyrin, develop much more rapidly and are brighter in colour. In pityriasis rosea, the patches are round or oval, with buff coloured centres and pinkish scaly margins. Close examination shows the scales to be attached by their outer margins—other scaly eruptions show scales to be attached by their inner margins. To add to this there is usually the history of a single early lesion called the "herald" patch.

The pigmentary syphilide usually appears as a mottling on the sides and back of the neck in women.

The most characteristic early syphilide is the papular eruption. The papules are rounded elevations of a raw ham or coppery tint varying in size up to that of a 10c. piece. The surface may be smooth and shiny or covered with a fine scale. Around the angles of the mouth, nose, between the toes and fingers they become cracked, septic and occasionally eczematous. About the anus, vulva, scratum, axillae they become swollen and oedematous and are known as condylomata. On the palms and soles they form rounded macules or small horny masses of a grey colour; the scalp becomes crusted from their presence.

The squamous syphilide may be covered with yellowish white scales which are either fine like pityriasis or coarse like psoriasis. They may occur anywhere but are most common on the palms. In the syphilide, the scales are thin on a brown-coloured base; removal of scales does not cause bleeding as in psoriasis; the areas affected in psoriasis are the knees, elbows, scalp and the extensor surfaces.

The pustular syphilide is distinguished from smallpox by the absence of severe general symptoms and from acne vulgaris by the absence of comedones or "black-heads."

The intermediary eruptions of the palms must be distinguished from psoriasis and eczema—psoriasis of the palms is rare and when it does occur is associated with a profuse psoriasis elsewhere and definite history of the disease.

Palmar eczema is usually bi-lateral, the margins of the patches irregular and broken up by islands of normal skin, the sides of fingers and the back of the hands will likely be seen to be involved as well, and the colour is reddish and associated with burning and itching.

Before going on to the late syphilides it will be well to mention affections of the epidermal appendages. In some instances, there is complete loss of hair over scalp, eyebrows, beard and moustache, but as a rule irregular thinning of the hair in ill defined areas occurs. In alopecia areata one finds round and completely bald patches. The most common affection of the nails is a dry onychia and a suppurative perionychia. As a rule two or more nails on each hand are involved; the plate may become discoloured, brittle, fissured or dotted over with small pits, sometimes the free edge becomes thickened and though not painful may lead to shedding of the nail. The perionychia usually affects several nails but is most frequent in the thumb and great toe.

Of the late cutaneous syphilides, the gumma will be taken as the type. These lesions are more persistent and are invariably followed by scars. The scars are wrinkled, and are not unlike a piece of tissue paper which has been crumpled up and spread out again. They are at first pigmented, then gradually become white but remain surrounded for an indefinite period by a brown halo. The gummata are nodular or subcutaneous. The nodular type appears chiefly on the face, hands, neck, shoulders and buttocks. As their position is somewhat determined by pressure, they are liable to occur on the nose from pressure of spectacles, about the waist in women, or in the garter area.

The subcutaneous is met with most commonly on the lower limbs, especially on the upper part of the calf—their position occasionally being determined by injury. In this stage syphilitic elephantiasis may be seen causing much swelling in such parts as the lips, penis, scrotum, vulva, nose and ears.

The late nodular syphilides have to be diagnosed chiefly from tuberculosis cutis, sycosis, acne necrotica, lupus erythematosus and rodent ulcer. The deep gummatous lesions have to be distinguished from varicose ulcers and Bazin's disease. The diagnosis from lupus vulgaris may be exceedingly difficult; the chief points of difference are as follows:—The syphilitic lesion appears in adult or late life—the tuberculosis ulcer in early life. Syphilitic lesions may extend in a few weeks over an area which it would take lupus vulgaris years to involve. Tuberculous nodules are brownish yellow and semi-translucent. Syphilitic lesions are circinate or serpiginous in outline, while those of lupus are irregular. Tuberculous ulcers have a poorly defined or ragged border and are shallow. Syphilitic lesions tend to heal spontaneously while tuberculous ulcers if untreated are progressive. The scars from lupus vulgaris are thick, irregular and lead to contractures; and again tuberculous ulcers are unaffected by anti-syphilitic treatment. Another very interesting point is that syphilis will destroy bone, while lupus vulgaris will destroy only cartilage.

In the case of lupus erythematosus the lesions are pinkish and rarely infiltrated; they pick out the prominent parts of the cheeks, nose, the ears, the scalp, and occasionally the hands. The scars are much less noticeable than those of syphilis. Acne necrotica picks out the forehead, sides of the scalp and nose. The lesions are more inflamed, resemble acne pustules and have pitted cicatrices like smallpox. Epithelioma of the rodent ulcer type is apt to be confusing. The ulcer shows a hard and cartilaginous rolled edge with dilated blood vessels running over the edge. It develops very slowly sometimes taking years to reach the size of a 10c. piece.

In sycosis of the beard, the lesions are more acutely inflamed and lumpy. The surface is studded with pustules and may be dotted over with short stumps of hair which are packed with the fungus.

The varicose ulcer may offer difficulty, but it is usually single, near the ankle, and associated with varicose veins.

Gummatous ulcers are usually multiple near the knee and circular with punched-out edges.

Bazin's disease or erythema induratum may resemble gummatous ulcers. It is an infection of young women, occurring at an age when gummata are extremely rare. The common site is the posterior surface of the lower third of the leg, and on healing they leave depressed, deeply pigmented scars.

The diagnosis of mucous syphilides from various skin diseases which involve the mouth is important. The mucous syphilides may occur at any period during the course of the disease;

for description they may be grouped as early and late. One of the earliest signs is erythema and congestion about the tonsils and fauces. Later, superficial erosions, raised mucous patches or ulcers may appear on the buccal mucosa. The erosion resembles the base of a broken blister, of a dull red tinge or of a colour compared to milk spots or the track of a snail. The typical mucous patch occurs in the same situation as the erosion. It is slightly raised, soft and covered with an offensive discharge.

The lesions in the mouth have to be distinguished from diphtheria, herpes, dermatitis herpetiformis, mercurial stomatitis and exfoliating marginate glossitis. From diphtheria by the absence of constitutional symptoms and by the demonstration of the Kleb's-Lœffler bacilli. From herpes by the fact that herpetic lesions affect chiefly the tongue, taking the form of superficial ulcers which coalesce to form polycycical patches, and are preceded by tingling or definite neuralgic pain. In dermatitis herpetiformis, the erosive lesions of the mouth are associated with herpetiform vesicles in the skin. In mercurial stomatitis, there is usually salivation and spongy gums. In the condition known as exfoliating marginate glossitis or geographical tongue, the lesions have the habit of altering their position. They have a greyish border and present no definite ulceration. They are not associated with other cutaneous symptoms nor with adenitis.

In the late mucous syphilides of the mouth, the diagnosis must be from tuberculous ulcers. In the latter the borders are not so indurated, and, instead of being deep and punched-out, are shallow and ragged. They are painful, develop more slowly than syphilitic lesions, do not react to syphilitic treatment and are generally associated with underlying tuberculosis in the larynx and lungs.

PYELITIS DURING PREGNANCY AND THE PUERPERIUM

Charles J. Currie, B.A., M.B.

Senior Obstetrician, Grace Hospital, Toronto

THE term pyelitis of pregnancy was applied to a disease arising usually in the latter months of pregnancy and which was believed to be peculiar to that state. It is still commonly used more as a matter of convenience than of correctness, for the condition is not limited to the pelvis of the kidney but may involve the other portions of the urinary tract. Moreover, it is not peculiar to pregnancy, nor even to women.

Pyelitis is always more common in women than in men, and more common to women in the pregnant state than at any other time.

A case of pyelitis in pregnancy was reported in 1840, but it was not until 1892 that attention was really called to it. Since that time it has become increasingly manifest that its occurrence is far more common than was at first supposed.

It is only within recent years that pyelitis in the puerperium has become recognized at all.

The predilection of this disease for pregnant women has been explained as being due to the dilatation of the ureters and pelvis from pressure by the pregnant uterus and in proof of this attention is called to the fact that it usually occurs after the 5th month and is more common on the right side. This explanation would not, however, account for those cases in which it occurs on the left side, and in the early months of pregnancy nor for those developing in the puerperium. Moreover, one must remember that it is just at this period that other serious diseases are most common in pregnancy, viz., toxaemia. I believe that the size of the pregnant uterus will ultimately be found to be by no means the chief factor entering into its occurrence.

In pregnancy, pyelitis most commonly occurs in primigravida around the 5th or 6th month. In the puerperium it is said to usually come on late, but in my limited series of cases this was not so, as in five out of seven it appeared in the first week and one of the other two is doubtful.

In the vast majority of cases it is a b. coli infection but not invariably so as other organisms are sometimes found to be the cause, viz., b. paratyphosis, streptococci and staphlococcus aureus. The infection is believed to gain entry to the pelvis by one of the following ways:—

(1)—*The hematogenous route*—The bacilli which inhabit the bowel gain entrance into the blood, are excreted by the kidneys and lodge in the pelvis. The entrance of these bacilli into the blood can readily be explained when one considers how much the resistance of the tissues and blood may have been reduced (1) by constipation and colitis, (2) overstrain and worry of approaching maternity, (3) by the toxins present in the blood, (4) by prolonged and difficult labor.

(2)—*The ascending route*—Here the bacilli are said to enter the bladder from the urethra and thence up the ureters to the pelvis. Those opposed to this view point to the fact that cystitis is present in only 5-6% of the cases of pyelitis.

(3)—By direct infection through the intestinal lymphatics. There is a possibility of organisms passing from the intestine to damaged tissue in its neighbourhood and such damage may occur both in pregnancy and in the puerperium. In opposition to this theory it is pointed out that there are other organisms than the b. coli in the intestine while it alone seems to produce the pyelitis. Possibly this might be explained by the fact that the urine is more favourable to the growth of the b. coli than it is to the streptococcus and other organisms.

The bacilli having entered the pelvis of the kidney, in order that they should find settlement there, it is necessary that its resistance must have been lowered in some way. This weakness may have been brought about by toxins present in the blood or by hydronephrosis due to the extra work the kidneys are called upon for in taking care of the excretion of the mother and foetus or from dilatation of pelvis and ureters by the pressure of the pregnant uterus at the brim. As said before it is claimed by some that the greater prevalence of pyelitis in the right side is due to the tendency of the uterus to lie to that side and to turn on its vertical axis, thus causing kinking of ureters.

Additional damage to the kidney for the puerperal period may have been caused by prolonged and difficult labour with distended bladder

In some cases during the puerperium the pyelitis is secondary to a cystitis, possibly from too careless use of catheter.

The symptoms of pyelitis vary with the severity of the case, but headache, fever, abdominal pain and aching in lumbar region, and tenderness over the kidney are fairly constant for all.

In the subacute or chronic type the symptoms may be quite mild and gradual in onset and not infrequently associated with cystitis.

In the acute cases the onset is sudden, often with chill or rigour. The fever rises suddenly to 103-104 or even much higher and the pulse is rapid.

There is acute pain in the abdomen which may be general or referred to one side, usually the right. The abdomen may be distended and rectus muscle held rigid. This may be associated with vomiting and marked constipation.

At times the temperature is very high and irregular. There is severe headache and repeated chills, suggesting a general septic condition. The urine is the chief diagnostic factor. In mild cases it may be plentiful and of low specific gravity; in acute cases scanty and of high specific gravity. It is turbid and acid in reaction and on examination shows pus and albumen varying with the quantity of pus. Bacteriological examination shows presence of quantities of the colon bacillus. Very occasionally one may find other organisms such as b. paratyphosis, staph. aureus or the gonococci.

There is a leucocytosis of 20,000 or 30,000.

Twelve cases of pyelitis have come under my observation comparatively recently.

Of these five occurred during pregnancy and seven during the puerperium.

Of the five occurring during pregnancy, three were of the subacute and two of the acute type, whilst of the seven seen during the puerperium six were acute and one subacute.

In eleven cases the right side was affected and in one the left. Of the cases occurring during pregnancy the onset was as follows; two in the second month, two in the 5-6th months and one in the 9th.

Of the puerperal cases, in one the onset was late. It was really a pyelonephritis secondary to puerperal sepsis. In another the onset was in the third month, but she gave a history of having run a temperature all through the puerperium. She left the hospital against advice and three weeks later had an attack of jaundice which soon cleared up, but she was in poor health throughout the time until the third month when the acute attack of pyelitis came on. It is possible that hers was a case of subacute pyelitis from the first week of the puerperium.

In the other five the onset was in the first week. The following is a short synopsis of the cases of pyelitis in pregnancy:—

(1).—A primigravida in the second month, the onset was sudden with severe pain in the right side and in the lower abdomen with pain and great frequency of urination. The right rectus was held quite rigid. Temperature was 101 . On examination the right kidney was found enlarged and tender. The urine showed presence of b. coli. This case was slow in recovery with a marked tendency to relapse.

(2).—A primigravida in her second month. The onset was slow with increasing frequency of micturition and a dull aching pain in the side. Examination showed tenderness over the left kidney and the urine was acid and contained both pus and the bacillus coli. The temperature never went over 100 . Her case was interesting as being the only one in which the pyelitis was on the left side. She did not tell me of her symptoms till after examination had shown pus in the urine.

(3).—A primigravida in the fifth month, the symptoms were so slight that the patient regarded them as only incident to her condition and the disease was first called to my attention by the presence of pus and a trace of albumen in the urine during a routine examination. Questioning elicited the fact that she had been suffering more or less with headache for some days and that she had a continual dull pain in the right side. There was quite marked tenderness over the right kidney. The urine contained b. Coli.

(4).—A multipara in fifth month with no previous history of pyelitis. The onset was very sudden and acute and resembled an acute abdomen so closely that it was first diagnosed as appendicitis. Her case was peculiar in that she never had a leucocytosis of over 12,000. It was a very severe case with much vomiting and ultimately labour had to be induced.

(5).—A primipara. This patient was seized with an attack of pain in the back and believing she was in labour came into the hospital. The pain subsided and she went to sleep that night. On the second day she again complained of pain in the back and on the right side. She had headache and fever of 102°, with all the clinical signs of pyelitis. The case cleared up in a few days. A week later she was confined and seven days later she had a relapse with temperature rising to 101° and headache but no pain. Her case cleared up again in a few days.

Of the puerperal cases the five having an onset in the first week were very similar in many respects. The onset was sudden with chill and temperature rising suddenly to from 103 -105° with rapid pulse and complaint of pain in the abdomen and headache. The pain in the abdomen seemed in each case to obscure the pain in the lumbar region and as a result four of the cases were diagnosed as acute sepsis.

Further examination, however, showed no real tenderness over the abdomen and all showed tenderness over the right kidney, and the urine contained pus, albumen, and in three the b. coli. The fourth gave a pure culture of staph. aureus. Four cases ran a rapid course to recovery, the whole picture closely resembling that of the so-called abortive type of puerperal sepsis.

One case, however, was not only very severe, but prolonged, and with a marked tendency to relapse.

In this case, the patient, a primipara, was seized with a severe chill two days after a normal delivery, and the temperature rose to 104 and the pulse to 120. She had severe headache and complained of pain in the lower abdomen, especially above the pubis. The abdomen was not distended nor the uterus tender on pressure. She did not complain of pain in the lumbar region, but on examination there was found to be marked tenderness on pressure over the right kidney which was also found to be enlarged.

The urine, on examination of a catheterized specimen, was acid in reaction and turbid. It contained quantities of pus and colon bacilli. The temperature remained high for the first week with remissions and she had chills each day for five days. The temperature then dropped to normal and remained so for two days when it suddenly rose again and the patient passed through a period similar to the first but without chills and this was repeated a third time. Each attack was milder than the preceding. By the end of the fourth week the urine had cleared up and was practically free of the b. coli. The temperature gradually dropped to normal and remained so. Throughout the greater part of the course of the disease the patient was greatly troubled with profuse sweating, insomnia was marked and obstinate and with it was associated a mild form of delirium. The patient was discharged from hospital between the sixth and seventh week and has remained well ever since, a matter of one year.

It is notoriously dangerous to draw conclusions from such a short series of cases as this. But possibly one is justified in hazarding the following opinions:—

(1).—The pyelitis in the early months of pregnancy is not so uncommon as is supposed, and many cases escape notice altogether, both on account of the mildness of the symptoms and because the patient does not come under the observation of the obstetrician until the late months of pregnancy.

(2).—That these undetected chronic forms of pyelitis occurring during pregnancy may be the source of the acute trouble during the puerperium.

(3).—That there is great danger of mistaking pyelitis o' the puerperium for acute sepsis. At least some of the abortive types of sepsis are cases of pyelitis which have undergone apparent spontaneous cure from the emptying of the pus from the pelvis of the kidney.

(4).—That it is very necessary to make a careful urinalysis in all cases of suspected sepsis during the puerperium and of acute abdomen in pregnancy.

Course and Treatment

In very acute cases with very high temperature the disease may run a rapidly fatal course, the patient dying in 8-10 days. But in the great majority of cases the disease shows a marked tendency to recovery under simple medical treatment, though relapses are said to be common.

The treatment of pyelitis is very simple in most cases. The patient should be put to bed so that the body may be kept at an even temperature and the work of the kidneys reduced to a minimum. She should be kept on a fluid diet for a few days to help flush out the kidneys. The main object in medication is to see that the urinary tract is flushed out with alkaline solution and this object is best obtained by the use of potassium citrate in large doses, viz., from 40-60 grains every two hours till the urine is alkaline when the dosage may be reduced but never to the extent of allowing the urine to become acid. The urine should be examined daily to make sure of this. After all symptoms have subsided for 3-4 days it may be discontinued.

Urotropin is not of value in acute pyelitis and Kidd says that in some cases it is dangerous, claiming that in one instance it caused the death of his patient. In only one of this series was any of the more heroic forms of treatment required. This patient was treated with urotropin for three weeks before the alkaline treatment was given. The fever disappeared in a few days, afterward the potassium citrate was given, but the patient's general condition was so bad that it was felt necessary to induce labour.

Urotropin and the acids are, however, of value in the chronic cases.

Brilliant results are said to have been obtained by catheterizing the ureters and instilling silver salts into the pelvis. But this can only be done by one who is an expert in the use of the cystoscope and is not without danger in the presence of the pregnant uterus, and in acute cases emptying the uterus may be necessary in very severe cases but is not often indicated nor always successful.

The use of serums has not been satisfactory. They fail for the same reasons as they have failed in the case of septicaemia. Autogenous vaccines may be of value in chronic cases.

Influenza Simulating Appendicitis—Dubs (*Schweiz. Med. Woch.*, April 13ht, 1922) points out that during the last wave of influenza there have been several cases in which the symptoms at the onset of the disease suggested peritonitis with perforation of some abdominal viscus. He notes as remarkable the fact that he saw no such cases during the epidemics of 1918 and 1919, whereas of late they have been frequent. With regard to the differential diagnosis of genuine appendicitis and influenza complicated by severe diaphragmatic pleurisy or inflammation of the nerves of the abdominal wall, he points out that appendicitis never begins suddenly, and that a temperature of over 39.2° C. at the onset of the disease in children is certainly not characteristic of appendicitis. The general appearance of the patient is instructive: in acute appendicitis the patient never looks feverish or shows conjunctival injection. A sudden onset with shivering and rigors is indicative of influenza rather than acute appendicitis, but the blood count is of little value in the differential diagnosis, as the leucopenia of influenza is a very uncertain phenomenon.—*Brit. Med. Jour.*, May 27th, 1922.

THE USE OF X-RAYS IN DISEASES OF THE SKIN

G. E. Richards, M.B.

Director, Department of Radiology, Toronto General Hospital

If the use of X-rays in the treatment of diseases of the skin is to be regarded as a scientific procedure, it must be based upon exact knowledge of the action which it produces on this tissue, and this action must be more or less uniform in its operation, so that it can be obtained and duplicated at will.

Fortunately, we are in possession of this information, and fortunately also the conditions are now such that dosage can be measured with great accuracy, so that the second condition is also fulfilled very exactly.

When normal tissue is exposed to a beam of X-rays the first effect is mild stimulation, and as the exposure is lengthened the effect passes through the various stages until necrosis and death of the cells results. And the point at which necrosis will take place can be determined with considerable exactness.

Hence in various diseases of the skin a dosage is selected somewhere between stimulation and destruction, depending upon the special requirement in that particular case.

The action of the rays upon the skin may be conveniently divided into two groups.

(1).—Early effects. The early effects are those which come on within about one month after exposure. If the dose has been a full one there will appear in from one to three weeks a slight congestion in the skin, which varies from a faint blush to vivid redness, but which is not accompanied by vesication. This is the so-called X-ray erythema, and is a normal result of a full exposure. It is the standard unit of measurement, and is called the erythema dose or skin-unit. Practically all other exposures are stated in terms of this unit, and it is important to draw attention to the fact that this is a perfectly normal response to a properly measured dose, and is in no sense a burn.

In some individuals this reddening is followed by deep brownish pigmentation, which may take weeks to disappear. This is due to the production in the skin of hæmosiderin. If granules of melanin are also present in the skin the deposit will be almost black, and in that case the colour may be permanent.

The second in importance of the early effects is loosening of the hair, if the area exposed is in a portion of the body in which a growth of hair is present. This loosening of the hair may vary from the simple loosening of a few hairs to complete depilation of the area, or even to permanent alopecia.

In the late effects we need only mention for the purposes of this paper (1) Atrophy. If exposures are long continued atrophic changes may occur. This, if continued, goes on to the production of keratoses or the chronic dermatitis commonly seen on the hands of men who have been much exposed to X-rays.

Telangiectases frequently occur in skin which has been the subject of long continued treatment, especially if erythemas have been produced at the time. These telangiectases may come on months or years after treatment, and are usually permanent. They, therefore, introduce an element of risk in exposing certain parts of the body, such as the face and neck, and great care should be exercised not to produce an erythema in these regions. If the dosage is kept under the degree of erythema the danger of telangiectases is almost negligible.

Having in mind, then, the foregoing physiological effects, it is comparatively easy to group the commoner skin diseases according to the manner in which they respond to irradiation.

(1).—Diseases for the cure of which epilation is necessary or desirable. Among these the best example is *ringworm.*

The treatment of ringworm by X-rays has been in successful use for many years, and in England has been developed almost into an exact science. The scalp is shaved, or if that is not possible the hair clipped short; the scalp then divided into five areas, and these are then treated in rotation in such a manner that the entire scalp receives an evenly distributed dose, which is so measured as to cause a complete epilation. In about three weeks the hair all falls out, and the ringworm of the hair-follicle becomes a ringworm of the skin surface, which can easily be destroyed by the usual applications.

Favus, being a similar disease is treated in exactly the same manner.

It should be noted that in both of these diseases the function of the X-ray is merely that of a depilatory. There is no means at our command of producing an epilation over a large area with anything like the ease and certainty which the X-ray offers. If the treatment has been exactly calculated and administered, the hair will grow in again in the ordinary manner. Accidents have happened, and probably will continue to do, but these are rare, and do not alter the fact that the most uniformly successful treatment of ringworm is accomplished by the use of this method.

Sycosis.—Sycosis and folliculitis barbæ will be included under the one heading. Here we have an infected hair follicle to which it is difficult to actually apply any medicament in a manner to reach the infection.

There are two methods of treatment possible for this condition. The first consists in the epilation of the entire affected area as was done in the scalp. But if the infection is extensive, such a dose will be sufficient to light up a very acute exacerbation of the infection, and this may be severe. In my opinion, except in a few selected cases better results are obtained by treating this condition by small divided doses in the same manner as other chronic infections of the skin, which will be referred to shortly. When so treated, the results are excellent, but the danger of re-infection is ever present, and usually the treatment will have to be continued for some time in order to destroy all the foci.

Hypertrichosis.—The removal of over-growths of hair would seem to be a simple procedure, if judged by what has been said about the certainty with which epilation can be accomplished. And it is true that hair can be removed with a high degree of success, but when it occurs upon the face as a downy over-growth, this is not true, and the attendant dangers are so great that few will risk the method. When the over-growth is in the form of a cluster of stiff hairs, these can be easily removed, but it is very difficult to ensure their permanent removal. Here, too, the danger of disfigurement is real, and the method is not a popular one.

(2).—The second great group of skin diseases includes all those which are accompanied by ulceration of the skin, such as lupus, epithelioma, rodent ulcer, varicose ulcers.

(*a*) *Lupus Vulgaris.*—There are many physical methods of treatment of lupus, and many of these are attended by such excellent results that it is difficult to decide which is the best. The X-ray offers an easy and inexpensive method of treating large areas, and the results are on the whole quite as good as can be claimed for any of the others, including Finsen light.

(*a*) *Epithelioma* of the skin should be considered in two stages.

(1).—Pre-epitheliomatous skin changes including senile warts and keratoses.

(2).—Definitely established epithelioma.

Having made this distinction we should next say with the Irish that the time to cure an epithelioma is before it has become one. The precancerous roughening of the skin and later the small, raised, warty excrescence is too much neglected until it begins to grow or ulcerate. Until the latter has occurred the X-ray treatment of these conditions is one of the most satisfactory procedures in the entire field of therapy, and should be successful in 100% of cases. The treatment is very simple, devoid of danger, and three applications should be the maximum ever required.

If the second stage has been reached the treatment is more difficult, but if it is still limited to the skin, even then the treatment is very successful, seldom dropping below 90% of successes if properly applied.

Epithelioma of the lip may be included in this group if a slight addition is made to the general statement. If the epithelioma of the lip has not infiltrated deeply into the lip it can usually be successfully treated by unfiltered radiation, such as we are now discussing, but if infiltration is present heavily filtered radiation will be necessary, and the outcome will be much less certain. In all cases the sub-maxillary areas should be treated by heavily filtered X-rays.

Rodent Ulcer.—All that has been said of epithelioma applies equally to rodent ulcer. In general it may be said that a rodent ulcer will yield to treatment—if:—

(1).—It does not involve bone or cartilage.

(2).—It has not already been unsuccessfully treated by caustics, strong acids or X-rays or radium.

The important point in these cases is to produce a severe reaction at the first treatment, if this is done healing will usually follow promptly. In my opinion, long-continued fractional dosage in these cases is the commonest cause of failure, and produces a condition in the ulcer which makes subsequent treatment exceedingly difficult.

(3).—The third group includes acute and chronic dermatitis. Under this heading may be considered the eczemas, psoriasis, acne vulgaris, furunculosis, onychia, carbuncle, etc.

Eczema.—Acute eczema with much exudation may be greatly benefited by very light stimulating doses of X-ray frequently applied. If benefit occurs it will usually be prompt and the reverse is also true, and if the condition is aggravated the treatment should be discontinued until the acute stage subsides.

Chronic eczema responds favourably to X-ray treatment in the majority of cases and except in industrial eczemas treatment will usually be followed by diminution of discharge, drying of the skin, relief of itching and irritation with permanent healing in the majority of cases. There is probably no more satisfactory group than the whole group of eczemas for treatment by X-ray.

Psoriasis.—Here the results are more erratic, and no safe prediction can be made as to the outcome of treatment. Some cases respond in a spectacular manner, while others apparently similar do not respond at all, and the conditions which determine this difference are not apparent. A fair percentage of cases, however, do receive such great benefit, that an experimental trial of the method is always justifiable. The type of treatment which we have found most beneficial has been moderately stimulating doses, unfiltered, corresponding to about one-half skin unit repeated every two weeks.

Acne Vulgaris.—I should like to include with acne vulgaris, such other chronic infections of the skin as chronic furunculosis etc. The treatment of these conditions is exceedingly satisfactory, and appears to be due to the property which X-rays have of causing a slight leukocytosis, and also of greatly stimulating the local activity of the skin. In this way the local resistance to infection is increased and the body can successfully control the infection, although there is no direct bacteriological effect of the rays upon the infecting organism.

In this way boils can frequently be aborted if treated in the early stage, while chronic boils frequently respond to this method after all others have failed.

It is probably for the same reason that beneficial results are obtained in acne. In general there are two beneficial effects which occur. (1) The control of the infection and disappearance of the pustules. (2) Lessening of the scarring which has resulted from former pustules due to the property which X-rays have of causing the absorption of fibrous tissue in inflammatory areas. For these two reasons the method is highly useful, and if practised carefully is devoid of danger. The entire affected area must be exposed to an unfiltered dose of about one half skin unit, and this may safely be repeated once every two weeks for three times when the interval should be prolonged. As a rule the improvement will become noticeable after the second or third application, but the treatment will require to be continued for some time in order to secure a good result.

Carbuncle.—There are few results more satisfactory than the treatment of the ordinary carbuncle. The only modification which this statement requires, to our knowledge, is that in the very early stages of carbuncle, little is to be expected from treatment, and also that in that form occurring upon the back of the neck we have not seen nearly such good results as in the usual large carbuncle upon the trunk which is discharging from several craters, rapidly extending and usually very painful. In such cases the pain is usually relieved very promptly and the entire carbuncle diminishes rapidly after a single treatment and should be completely gone in less than one week. Very seldom is it necessary to make more than two applications. The technique used is three-quarters of an erythema dose without a filter, and this may be repeated in four days.

EYE CONDITIONS IN PREGNANCY

Charles Graef, M.D.

New York

THE following observations on eye conditions found during pregnancy and lactation are based on the study of such cases in private practice and in two active New York Hospitals in which for a period of over fifteen years, the writer has had charge of the eye service.

While studies of the eyes have been limited for the most part to cases in which troublesome eye symptoms have aroused the attention of the patient or her attendants, observations made in a considerable number of apparently unaffected eyes in the obstetrical wards have shown that pathological changes are present at times when no symptoms of sufficient consequence to disturb the patient have become manifest, or when such symptoms, if noted by her, have been passed over as of no importance or accepted as a part of the routine experience of maternity.

To some medical men the phrase "eye conditions of pregnancy" suggests albuminuric retinitis only. If the urine examinations show nothing wrong they are inclined to feel that no unpleasant experiences, including eye lesions of consequence, need be anticipated. This faith is not constantly justified, and I shall cite some evidence directly to the contrary and wish to outline the history of some examples of such eye conditions which have occurred among our cases.

In pregnancy the eyelids have with the rest of the body a tendency to pigmentation which is sometimes very striking. The occurrence of troublesome styes on the lids is quite frequent in the earlier months, and is common again during lactation.

The cornea and conjunctiva may give trouble, from outbreaks of phlyctenular disease, while weakness of various eye muscles manifests itself by failure of the accommodative power (ciliary asthenopia), perhaps by diplopia from weakness or spasm of one or more of the extraocular group, or in milder cases by headaches due to eye strain of this type.

One of the most common conditions is the relaxation or paresis of the ciliary muscles occurring, often rather suddenly, either before or after delivery, or still oftener during the early lactation period. Patients who are hyperopic or astigmatic may experience a startling loss of accommodative power from this, with consequent inability to see clearly, especially to read or sew, and are usually much alarmed at their plight. Time and rest, bringing restored vigor, are all that are needed for most of these cases, although in some instances temporary or permanent use of suitable glasses to restore the focussing power of the eyes is indicated. Not a few of these cases, unexamined, pass, because of the visual defect, as instances of albuminuric retinitis.

Such cases occur most often in women who have had frequent childbirths or have lost much blood in delivery. Severe anaemia may be found under such circumstances and pathological changes, such as oedema of the lower lids or even retinal haemorrhages may result. It is to be remembered that in general anaemic or plethoric cases, the eye affections as a rule do not correspond to the underlying blood conditions. More often the amount of blood in the eye is the reverse of that in other parts. In anaemia especially we often have a conjunctival hyperaemia of an obstinate and persistent type. It is only in the high grades of general engorgement that the retinal vessels are found to correspond. Pulsation of the retinal arteries on slight pressure upon the eye is a striking sign of diminished blood pressure obtainable at times in cases of severe and prolonged anaemia. The retinal haemorrhages occurring in these cases are probably due to defective nutrition of the vessel walls as well as to faults in the blood itself.

The emotional influences of pregnancy and labor may be manifested by various eye symptoms clearly of hysterical type. There are visual disturbances ranging from retinal hyperaesthesia with exaggerated distress on use of the eyes and photophobia or complaints of polyopia to disturbed vision with narrowing of the visual fields, and occasionally absolute blindness. In purely hysterical cases no evidence of ocular disease can be found but it is probable that in some of these so termed, the retinal elements are affected by circulatory or toxic disturbances of too low a grade to betray their presence through recognizable signs.

We have had several cases in which serious iritis occurred preceding labor in patients who showed no evidence of syphilitic disease. Several striking cases of hemeralopia were likewise observed, lasting through the later months of pregnancy. These patients had good central vision with no difficulty during bright daylight but became markedly amblyopic at dusk or in a poorly-lighted room. There was no evidence of retinal affection; the symptoms being probably due to poor nutrition of these parts; analogous to the retinal torpor and atrophy seen in retinitis pigmentosa. Such cases are not likely to be overlooked as they are much impressed with their symptoms and generally insistent on detailing them.

Eye conditions associated with albuminuria present our most serious problem. They may occur at any time but are most often found in the later months of pregnancy; partly as the result of stasis and mechanical obstruction to the kidney circulation, and partly as the result of parenchymatous nephritis.

The most important of these are the affections of the optic nerve and retina and the visual changes due to intra-cranial lesions. Temporary oedema of the lids may be looked for, but is absent in many cases. Often however there is oedema of the lower lids when no oedema is present elsewhere. Permanent oedema occurs here only when the ankles and legs are oedematous or general ascites is present.

Hyperaemia of the nerve-head, oedema of the retina, retinitis, neuritis, neuro-retinitis, and choked disc, with or without exudates and haemorrhages are among the important conditions revealed by ophthalmoscope and in our experience have led to definite recognition of a toxic renal affection in some cases which had shown nothing more than vague symptoms of headaches, etc, and in which urine tests were indecisive.

Neuritis and neuro-retinitis are usually accompanied by whitish patches of exudate and haemorrhages: these may be found together or occur separately.

The macula and the borders of the optic disc are commonly most affected, the fovea centralis remaining well defined as a dark or reddish-brown spot. Towards the periphery the exudates are few and small.

The whitish exudates may be few, slight, and scattered but usually form the familiar stellate figure around the macula and if the condition is prolonged, at a later stage these spots tend to fuse into larger masses of irregular form.

These appearances in the fundus do not differ from those found in cases of retinitis due to causes other than pregnancy but show of course much more tendency to complete clearing up after the uterus is emptied, and healthy kidney function is restored. Another striking difference is the comparative frequency with which the retinal oedema in these cases causes folds or actual detachment of the retina. This may be a single fold or may be a quite extensive detachment of this organ. These also tend to rapid and spontaneous cure after delivery. Two such cases have been under my observation in Fordham Hospital within the past six weeks. Impairment of vision was very marked in both cases, being reduced to little more than light perception when at the lowest. The retinal folds have become replaced and vision is slowly returning as the exudate disappears, having shown 20/100 at the last test.

The disturbance of vision in cases of retinitis and neuro-retinitis varies greatly. It is often slight but may be very pronounced especially if there are haemorrhages into the macula.

The ophthalmoscope often shows extensive changes in the fundus when we have comparatively slight effects on the vision. Sight is most impaired when the optic nerve is markedly affected. Much of this may be retro-bulbar and betray itself only later by the atrophic changes that follow. When I find only slight evidence of disease in the retina and nerve head with markedly affected vision I incline to a rather unfavorable prognosis. The nerve is likely to suffer permanent damage, often of a high degree, and I believe haemorrhages into such an affected nerve trunk are not uncommon; the staining and discoloration showing later on the atrophic disc are due to such haemorrhages.

Disorders of the color sense may be looked for when the nerve is affected but vision is commonly too much disturbed to make such a test of any value. Subjective color vision is sometimes reported by the patient who may state that everything has a greenish hue to her.

While unilateral affections of the nerve and retina are not uncommon from albuminuria due to other causes, both eyes have always been involved in cases caused by pregnancy in my experience.

Studies of the morbid anatomy of such eyes show that retinitis is mainly a disease of the vessels; involving not only the vessels of the retina but of all parts of the eye in severe cases. Other lesions are secondary, including the haemorrhages, oedema, folds and detachments of the retina, and the fatty degeneration causing the white spots—(*Knies*).

The retina suffers so much damage because the arteries are end arteries and thus have not the compensatory advantages readily afforded in other parts by a collateral blood supply: For this reason the non-vascular area of the macula shows the earliest changes such as the stellate figure due to fatty degeneration in the nerve fibre-layer. If haemorrhages appear early it is an evidence of either weak vessels walls or sharply toxic blood condition. In such cases haemorrhages occasionally occur in the conjunctiva.

Of the intracranial symptoms of albuminuria, paralyses of the muscles have been mentioned. These lesions are probably caused by haemorrhage in the nerve roots or trunk. These paralyses are not so common in pregnancy as in albuminuria due to other causes and usually recover rapidly. If they occur after delivery they are more probably associated with persistent and severe vascular disease and may be accordingly regarded as of serious import.

Uraemic blindness or amblyopia is much more common than muscular paralyses. It is a part of the uraemia; is usually of rapid devel opment, and the ophthalmoscopic appearances are negative even in cases of complete blindness.

In the purely uraemic cases the pupil is usually dilated but may be contracted. The light reflex is retained. If the pupil does not react, the optic nerve or primary optic ganglia are affected and some signs of stasis are usually in evidence in the optic papilla.

The blindness in uraemia is due to oedema or circulatory disturbance in the optical cortex of the occipital lobes. We have an analogue in the condition known as scotoma scintillans. This is a temporary blindness usually associated with some vertigo; the patient sees a sparkling, scintillating area formed of lines zig-zagging in irregular angles, other objects being invisible. It clears up in a short time leaving the patient with headache and sometimes nausea. It is explained as due to irritation of the optical elements in the cortex,—an irritation which according to the laws of projection is referred to the external world. Something of the same sort is often experienced before fainting attacks and in certain types of epilepsy the visual aura is probably of similar origin.

The fleeting character of the lesion explains the rapidity with which sight returns in these uraemic cases after recovery from the illness.

Cases of sudden blindness without uraemia may occur which show no signs of retinal affection at first, but more careful study will show narrowing of the retinal vessels, or pallor of the disc as evidence of retro-bulbar neuritis.

I append the history of one of the most striking of our recent cases at Fordham Hospital.

C.N., Age 36.—Family history shows cancer and tuberculosis. She has had four living children and three spontaneous abortions.

Present Illness.—Soon after becoming pregnant, patient noticed blurring of vision in the left eye. Following this the right eye behaved in a similar manner, so that when the patient was ten weeks *gravid*, she was completely blind. I saw her first in her eighth month. Eye examination showed complete double optic atrophy. It had the appearance of a secondary process. The lamina cribrosa was not visible and the vessels were noticeably small.

General physical examination showed a marked pyorrhoea alveolaris and signs in chest suspicious of a tuberculosis process—in the right lower lobe.

The urine output was normal and repeated examinations were negative. Blood Wassermann was negative; spinal fluid was under slightly increased tension but otherwise negative.

X-Ray examination showed no evidence of pathological lesion in skull; there being no evidence of increased intracranial pressure and the sella turcica being normal.

Blood chemistry examinations showed normal results.

Neurological examination was negative.

Because of the marked pyorrhoea, most of the teeth were removed and the others treated but there was absolutely no effect upon the vision of the patient.

This woman was delivered some weeks since of a healthy baby at full term. I re-examined the eyes a week ago. The pupils react slightly to light but she has regained no vision and I see no prospects of her doing so.

This case must be put down as one of severe optic neuritis in the early months of pregnancy due either to toxic causes of which we could find no trace remaining at the eighth month when she came under our care, or to the pyorrhoea. It is the fashion now to attribute so many ills to diseased teeth that perhaps some of you may incline to that explanation of this case. Teeth infections as an etiological factor are being overworked at present, I think, and I expect the pendulum of professional opinion will swing to the opposite in time. The case is at any rate a good illustration of the need for team work between the obstetrician and ophthalmologist in cases where eye symptoms are manifested in pregnancy.

It is altogether probable that something worth while could have been done for this poor woman if her exact condition had been determined when her sight first began to fail.

A word as to the action to be advised in cases of albuminuric retinitis. I have asked the opinion of some of our most experienced men in this field of medical work; both obstetricians and ophthalmologists. One says: "When the kidneys are affected early in pregnancy abortion is called for and in the later stages premature delivery. Religious scruples interfere at times and I have seen this result in blindness in a few cases."

Another writes: "I regard a case of albuminuric retinitis that is getting worse in spite of treatment as an indication to empty the uterus without delay. The ocular complications of eclampsia, unless the case is one due to chronic nephritis associated with the pregnancy, do not call for such interference.

THE CAUSE, SYMPTOMS AND DIAGNOSIS OF NASAL SINUSITIS IN THEIR RELATION TO GENERAL PRACTICE*

W. S. Hunt, M.D.

Port Arthur

DISEASE of the nasal accessory sinuses holds much the same position in medicine to-day, as appendicitis held in abdominal surgery, thirty-five years ago, when the latter had emerged from the generic classification of inflammation of the bowels. So, now, from the old family diagnosis of catarrh, has evolved several separate species, of which perhaps the most common is sinusitis. Like appendicitis, this disease varies greatly in severity, from a mild, self-limited affection, to a rapidly fatal conflagration or a slow, smouldering fire whose presence can hardly be detected, but whose far reaching effects cannot be overestimated.

A full discussion of sinusitis, its etiology, symptoms and diagnosis, would be too big a subject to be dealt with in an address of this kind. I shall, however, consider in brief the more important points which may be of interest to you as general practitioners

The function of accessory sinuses of the nose is still a matter of debate, but it is generally accepted that they provide resounding chambers for the voice and also help to supply moisture to the inspired air.

You are all familiar with the anatomy and physiology of the nasal accessory sinuses, but a short resume may be helpful. The sinuses are bony cavities lined by ciliated epithelium and are normally filled with air which is constantly being changed by the act of respiration. The frontal sinus and anterior ethmoidal cells open into the middle meatus of the nose under cover of the middle turbinate. The posterior ethmoidal cells and sphenoid sinus drain into the superior meatus. All the sinuses except the frontal open directly by means of ostia into the nasal cavity. The frontal, however, is drained by a canal which passes downward and backward to a trough formed between the uncinate process anteriorly and the bulla ethmoidalis posteriorly. At the lower end of this trough is found the ostium of the maxillary sinus. Hence it is, that in some cases, pus from the frontal sinus may drain into the antrum which then acts as a reservoir, without necessarily participating in the infection.

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The contents of the sinuses are normally sterile, but their lining mucous membrane has considerable power to resist infection so long as the ventilation and drainage is freely maintained. People living or working in dusty atmospheres constantly inhale bacteria, but these usually cause no trouble in the sinuses, unless the resistance of the patient be already lowered by some constitutional disease or there be some obstruction to drainage.

Infection of the sinuses occurs in every attack of acute coryza but the influenza bacilli are the most formidable adversaries against which the mucous membrane of these air chambers has to contend. They are the storming troops of the invading host, and, having broken down the barriers of defence, they depart, leaving an army of occupation composed of the ordinary pyogenic bacteria, such as the staphlococci, streptococci and pneumococci, to carry on. Thus it is, that so many cases of maxillary and frontal sinusitis, date the origin of their trouble from an attack of 'flu or grippe. In the case of the antrum, there is also another possible source of infection, namely, the infected roots of the upper molars and bicuspids which come into close contact and, in a few cases, perforate the floor of the sinuses.

As a predisposing cause of sinusitis, nasal obstruction holds the first place. It may be due to a deflected septum pressing against the outer wall of the nose, an hypertrophid turbinate or a large bulla ethmoidalis blocking the middle meatus. In a few cases, new growths, such as sarcoma, or foreign bodies are accountable for the obstruction. The second factor which predisposes to infection is the small size and mal-position of the ostia, as in the case of the maxillary and sphenoid sinuses, which can only be dependent when the patient is recumbent. Heredity exercises no direct influence, but there is reason to believe that many children and even infants are infected, and develop either acute or chronic sinusitis as a result of a similar disease from which their parents are suffering.

Infection of the sinuses, however, is usually encountered after the age of puberty for the reason that the frontal and sphenoid remain undeveloped until the sixth or eigth year. Suppuration, however, frequently occurs even in small children as a complication of scarlet fever, measles and diptheria. It should always be suspected in cases of obscure pyrexia, especially when an examination of the lungs, ears, and throat are negative. The persistence of a nasal discharge in children after the removal of tonsils and adenoids, should always lead the physician to suspect some sinus involvment and especially if the discharge be more profuse from one side of the nose.

The purulent discharge from the sinuses may either be blown out through the anterior nares or pass backwards into the naso pharynx, from which it is expectorated by the patient. In many cases, however, the discharge reaches the larynx, where it sets up a chronic laryngitis or a descending bronchitis, while in others in which the pus is swallowed symptoms such as loss of appetite, nausea and vomiting occur. The discharge from the anterior nares has been shown by C. P. Holmes to be the cause of recurrent attacks of facial erysipelas.

The presence of acute sinusitis is usually accompanied by headache, discharge, tenderness and changes in the nasal mucous membrane. Headache is generally the most prominent symptom, either a dull ache or neuralgic in character. It is aggravated by bending or stooping, and by the use of tobacco and alcohol, but it is not often affected by reading. It has, as a rule, a certain periodicity in its onset and duration. Many cases will state that the pain starts soon after breakfast and persists until about four o'clock, the relief frequently accompanied by a discharge of pus from one side of the nose. The site of the pain gives some slight indication of its source. If due to frontal or maxillary sinusitis, it is referred to the supra orbital region of the same side. In ethmoidal suppuration, the pain is felt between the eyes or on top of the head and in sphenoid inflammation, the pain is usually occipital. The discharge, which at first may be watery soon becomes thick and yellowish, due to the presence of pus. It may be blown out in great quantities through the anterior nares, but in many cases, flows entirely into the naso pharynx where it may cause an acute otitis by spread of infection up the eustachian tubes, or a pharyngitis. The latter condition is frequently mistaken by the patient and also by the physician for tonsilitis, whereas the tonsils may not be affected at all. In antrum disease the post nasal discharge occurs generally during the night, and the patient finds a collection of muco pus in the back of the throat on rising. This is sometimes so difficult to expectorate, that attempts to dislodge it may produce vomiting. Tenderness is usually most marked in frontal sinusitis, and is elicted by pressure over inner roof of the orbit. In acute maxillary sinusitis there may be tenderness over the antrum or in the canine fossa. The changes in the mucous membrane consists in either a hypertrophy, with or without the formation of polypi, or an atrophy. The latter may be a late stage of the former.

The acute exacerbations of chronic sinusitis are similar in manifestations to a simple acute attack except that there remains through the latent periods some chronic obstruction in the nose due to congestion of turbinates or the presence of mucous polypi.

Evidence of a latent infection is also given by the excessive use of handkerchiefs, frequent colds and sore throats or frequent headaches with perhaps occasional dizzy spells. As in the acute attack, these symptoms are aggravated by the use of tobacco and alcohol. I have seen many cases, too, in which the most prominent subjective symptoms was a ringing in the ears due to a low grade infection of the middle ear and tube.

There are two forms of non suppurative sinusitis in which the symptoms are due to mechanical irritation or to low grade toxaemia. One form called vacuum sinusitis is caused by the absorbtion of air in the sinus of which the osteum has been closed. This condition most frequently occurs in the frontal sinus on account of its long canal and is characterised by severe supra orbital headache, increased by efforts to read and associated with tenderness on pressure over the pulley of the superior oblique muscle. The second form of non-suppurative inflammation which most frequently affects the ethmoids or the sphenoid is called hyperplastic sinusitis. The etiology is unknown although recently the absence of certain vitamines in the food has been suggested as a primary cause. This disease is most insidious in its onset and may lead to serious results through the involvement of the optic nerve. The most frequent symptoms of this condition is an intractable neuralgia of the trigeminal nerve sometimes simulating a tic doloreaux.

The constitutional symptoms which accompany sinusitis, are usually mild in character, although in children high temperature and often delirium may occur. In long standing cases, a general run down condition of the patient is frequently found, associated with anaemia and loss of weight, inability to concentrate. This may lead to severe forms of neurasthenia. W. M. Mollison of Guy's Hospital, reports two cases in which complete loss of memory resulted from a chronic maxillary sinusitis.

The role of focal infection which has come into such prominence during the last five years is one that particularly applies to disease of the accessory sinuses. The results of this focal infection are seen in cases of multiple arthritis, recurrent attacks of iritis or conjunctivitis, retinitis, optic neuritis, which may go on to optic atrophy and complete blindness. In many cases of fatal meningitis, autopsy shows the site of primary infection to have been the accessory sinuses. Orbital cellucitis has frequently been reported as a direct result of the spread of infection. Obscure cases of abnormally low blood pressure have been found to be due to a focal infection in the sinuses, and in two cases of bronchial ashma I was able to give relief by draining infected antra.

The diagnosis of sinusitis is in some cases very simple, while in others only repeated examination by an experienced rhinologist will suffice to reach a conclusion. The history of long standing headache should always suggest the possibility of sinus disease, particularly if the pain is periodic, worse on stooping or aggravated by smoking and alcohol. A post nasal discharge may not be discovered without close inquiry, but its presence should be considered pathognomonic of sinusitis. The amount of discharge from the anterior nares may be roughly estimated by the number of handkerchiefs required in a day. Examination of the nares frequently reveals the presence of pus in the middle meatus if the antrum, the frontal, or anterior ethmoidal cells are affected and in the superior meatus if the sphenoid or posterior ethmoid cells are diseased. The posterior pharyngeal wall should always be examined and the presence of muco pus or hypertrophy of lymph follicles will direct one's attention to the accessory sinuses. In latent disease where the discharge is very scanty or absent, the result of infection may often be seen in the hypertrophy of lymphoid tissue extending down both sides of the posterior pharyngeal wall just behind the posterior pillars, or in excoriations of the anterior nares. The presence of a dry tickling cough, worse at night, can often be explained by irritation of a nocturnal post nasal discharge.

X-Ray examination is a great boon to the rhinologist of the present day. It should be used in every case where there is any suspicion of disease in the sinuses. It not only aids in the diagnosis but in many cases, definitely locates the disease. The interpretation of the plates, however, should be in the hands of the physician, as only by bearing in mind all the clinical evidence while reading the plate, can the diagnosis be made. The skiagraph is of particular value in determining the location and size of the maxillary and frontal sinuses, the thickness of their mucous membranes and the presence or absence of pus. The exposure should be made in three positions, first with the nose and chin, second with the nose and forehead resting on the plate and the third taken laterally. Occasionally a fourth, or axial position is helpful. In this, the plate is held under the patient's chin. Its purpose is to reveal the condition of the sphenoids. Transillumination is another means of examining the sinuses, but its results are often misleading. It is successful in comparing the translucency of the antra or the frontals. Suction by means of a mechanical pump or a rubber bulb has been used both in the treatment and in the diagnosis of sinus suppuration. When pus is not found in first examination of the nares, it may sometimes be aspirated from the sinuses.

In conclusion I would like to cite a few examples of sinusitis in which one or more classic symptoms and signs were either absent or overshadowed by some other condition, but in which the diagnosis was confirmed by operation.

Case 1.—Boy, nine years—tickling cough for weeks, history of post nasal discharge, nasal obstruction due to hypertrophy of inferior turbinates, *no headaches, no pus* visible in nose or throat but post pharyngeal wall appears granular. Transillumination appears negative, X-ray shows left ethmoids and left antrum cloudy. Diagnosis:—left maxillary sinusitis and ethmoiditis.

Case 2.—Male, Age 29—Post nasal discharge for three years, worse in morning, *no headache*, or tenderness, tinnitis in left ear at times, nasal obstruction at night, *no sore throat*. Transillumination negative. X-ray shows left antrum cloudy. Diagnosis:—left auxillary sinusitis.

Case 3.—Male, Age 28—Right ear feels stuffy and patient has considerable post nasal discharge. Left inferior turbinate hypertrophid *no headaches, no pus* in nose or throat but posterior pharyngeal wall congested and lymph follicles hypertrophied. X-ray shows left antrum cloudy. Diagnosis:—Left maxillary sinusitis.

Case 4.—Female, Age 30—Neuralgic pain over the eyes, worse on right side. Had glasses prescribed without relief. *No pus in nose* on examination or with suction. X-Ray shows both frontals and antra clear, ethmoids negative, infraction of middle turbinate and currettage of hyperplastic ethmoids gave complete relief.

Case 5.—Male, Age 42—Complains of blurred vision in right eye, coming on suddenly. Examination reveals a detached retina, no pus in nose, x-ray negative, septum deflected with hypertrophy of the right middle turbinate which when removed exposed a hyperplasia of the posterior ethmoids and sphenoid. Eventration of the diseased cells was followed by rapid absorbtion of the fluid under the retina and improvement in vision.

A SIMPLE CROSS AGGLUTINATION TEST FOR BLOOD DONORS, USING HEMOLYSED BLOOD*

Norman M. Guiou, M.D.

Ottawa

THOUGH it is now almost six years since the writer had the privilege of learning the art of Blood Transfusion while a Surgical Interne under Dr. C. K. P. Henry, at the Montreal General Hospital, and although much has been written on the subject since that time, there are still many smaller places where it is not being done, and there are many men who graduated before it was taught in the schools who hesitate to make use of this life-saving measure.

Since a blood transfusion may be given almost as simply as an intravenous saline, it must be that the hesitancy is due to difficulties in the way of testing the blood.

The recent placing on the market by a reliable firm of human Serum II and III makes very easy the procuring of the wherewithal to do the grouping test, and the simple cross agglutination test about to be described requires no centrifuge, and as a rule no microscope, and can be done by a country doctor in the remotest farmhouse.

The grouping test, while not a necessity, is a convenient way of rapidly selecting a volunteer of the same group as the patient, who is further tested, unless the risk of delay is greater than the risk of incompatibility, by a direct cross agglutination test between his blood and that of the patient. The old laborious method of crossing cell suspension and centrifugalized serum has largely been replaced by various modifications of the Rous and Turner (1) test where 9 parts of citrated blood of one are mixed with 1 part of citrated blood of the other and *vice versa*. Examination under the microscope reveals any clumping, if present, amidst 9 times the amount of unclumped cells. While a good test in the hands of the expert, these 9 extra parts of cells are confusing and very liable to lead the novice into error. It was an effort to eliminate them in the Rous and Turner test which lead to the development of the present method. Recalling methods of destroying red cells, freezing and thawing was the first to present itself, and small thin walled tubes such as used in Wassermann work were found to stand rapid freezing and thawing of

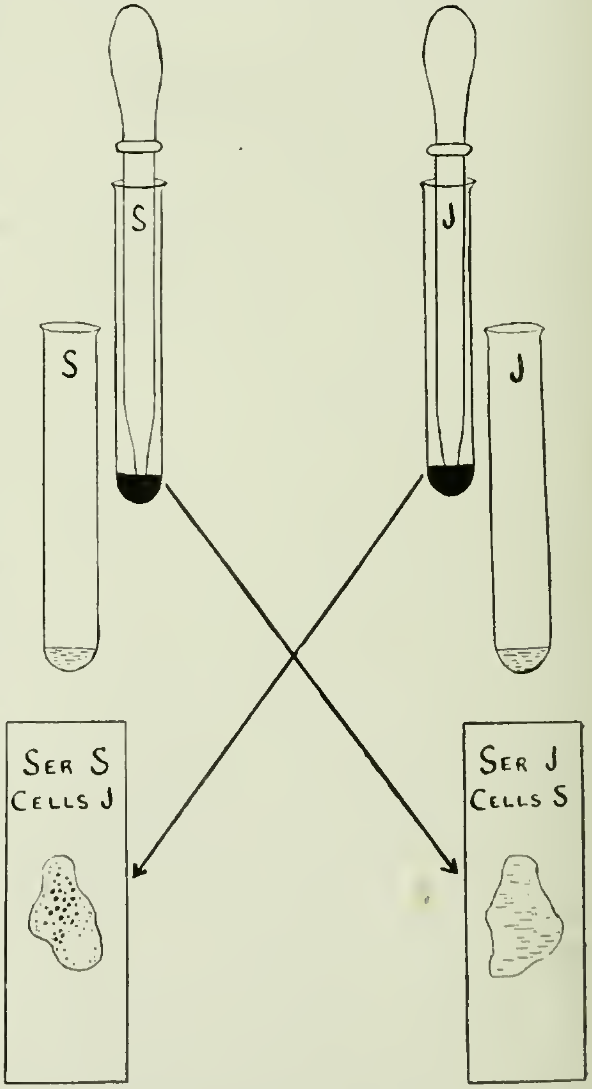

Fig. 1.—Diagram of the test. Rear tubes—citrated whole blood. Forward tubes—the same hemolysed, which is then poured out on the corresponding slides in front.

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*A preliminary report of work done while House Surgeon and Resident Obstetrician at Harlem Hospital (Bellevue and Allied) New York, where the frequent urgent need of a donor demanded the development of a simple bedside test.

their contents without breaking. The technique of the test is as follows:

Equipment necessary:—

- 1 small vial of isotonic sodium citrate solution (3.85%) with a medicine dropper in its stopper.
- 4 small test tubes $2\frac{3}{4}$ inches long.
- 2 nippled pipettes long enough to reach to the bottom of the test tubes (medicine droppers are too short, they may be made from glass tubing or by cutting down plain ungraduated urinalysis pipettes)
- 1 wax pencil.
- 1 blood sticker (a No. II Hagedorn needle in the stopper of a small bottle of alcohol).
- 2 slides.
- Absorbent cotton.
- Ethyl Chloride (The Gebauer screw valve tube is most economical).

Everything except the ethyl chloride may be carried in a small box in the pocket together with Serum II and III for group testing.

Two tubes are initialed at the top for both donor (Mr. Jones) and patient (Mr. Smith). One tube for each party is placed in the back row of a test tube rack, or in a tea cup, and a drop of isotonic citrate placed in each. The empty tubes are placed in front of their respective mates, either in the rack or in a second tea cup. Two slides are marked—"Serum Jones": "Cells Smith" and "Serum Smith": "Cells Jones," and placed in front of their corresponding tubes.

Both donor and patient are bled 5 drops into their respective citrate tubes and the tubes gently tapped with the finger to ensure good mixing. If the blood is dark, it should be shaken till it gets oxygenated and bright red in colour. *See Fig. 1.*

A nippled pipette is now placed in each tube and almost all the blood in one tube drawn up, the pipette removed from the tube, and any blood on its sides carefully removed with moist cotton. This blood is now deposited at the bottom of the corresponding empty tube in front, and the pipette carefully withdrawn so as not to get any blood on the side of the tube. The pipette is replaced in its original rear tube, and the process repeated with the other specimen.

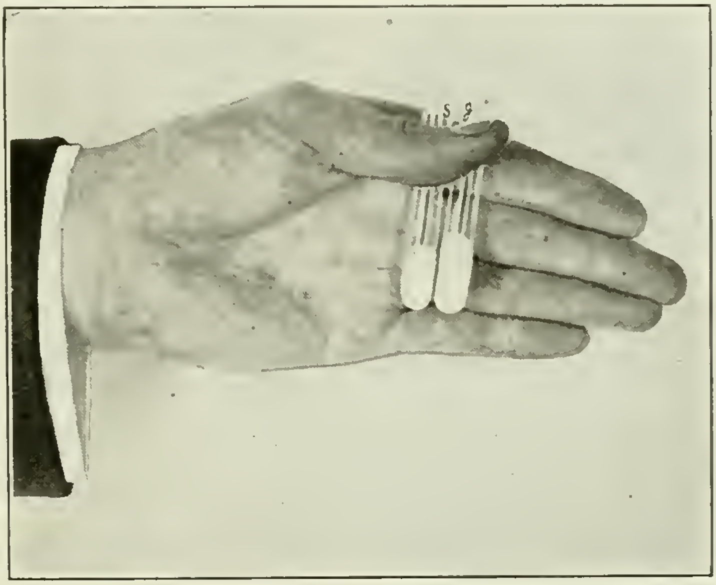

FIG. 2.—Showing the tubes of blood immediately after freezing, and before the removal of the ethyl chloride snow. (Photo by Natural Resources Branch for Dominion Dept. of Health).

We now have two tubes of blood from each case. The larger volume in the bottom of the clean front tube is to be laked.

The shirt front is unbuttoned, the two front tubes are picked up in the left hand, the wax initials being turned to face each other to avoid being rubbed off. The right hand now directs a spray of ethyl chloride against the lower part of the tubes till the blood is frozen through (told by looking down the tubes). *See Fig. 2.*

The snow is now removed with the handkerchief and the tubes held in the axilla to thaw. Even after the first thawing considerable hemolysis is in evidence, but the process is repeated three times to ensure complete cell destruction. If a jet from the ordinary ethyl chloride tube is used, one should stand in a current of air to avoid feeling light-headed. After the tubes are warmed in the axilla, the contents of each are dumped out on the corresponding slide. This clear hemolysed blood is referred to as the "serum" in the test, for simplicity. The pipette from the opposite whole blood tube, which will carry a small quantity of blood on its tip, is now stirred around in each pool of "serum"; thereby mixing in the opposite cells. The slides may be picked up and rocked a few times when agglutination, if present, will be apparent in a minute or two. *See Fig. 3.*

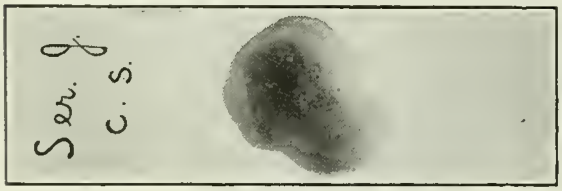

FIG. 3.—Photo of an actual test showing the MACROSCOPIC AGGLUTINATION.—Retouched on account of the faint impression made by the red color on a photographic plate. (Natural Resources Branch for Dominion Dept. of Health).

If a slide appears doubtful, examination of the top of the drop (Farmer) under the microscope will differentiate between agglutination and rouleaux formation. The latter is slower in appearing and the granules are smaller. If no microscope is available, as was the case in advanced dressing station work in the army,* the donor with a doubtful test should be rejected. Except for the reddish tinge to the clear fluid of the drop the test resembles the macroscopic group test with Serum II and III.

Numerous cross agglutination tests by this method between persons of known blood groups showed marked agglutination between incompatible bloods and no agglutination where none was expected. In four cases where this test showed no agglutination on either slide and was the only cross agglutination test used, transfusion operations were successfully carried out.

Where no Serum II and III is available, as is likely to be the case in many places where the doctor finds himself suddenly confronted with an ectopic pregnancy, placenta prævia, or other grave hæmorrhage case, this test is the only one necessary.

In conclusion, the blood of a prospective donor may be tested out in a few minutes with no unusual equipment save a few small test tubes and a couple of cut down urinalysis pipettes.

REFERENCE

1 ROUS AND TURNER. *Jour. A. M. A.*, June 12, 1915.

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*GUIOU. Blood Transfusion in a Field Ambulance. *B. M. J.*, June 22, 1918.

The Vital Capacity of "Cardiacs".—The vital capacity of fifteen so-called "cardiacs" who were afflicted with aortic regurgitation and mitral stenosis was investigated by Russell Burton-Opitz, New York, by means of a spirometer devised by the author for the purpose of registering the tidal air as well as the inspiratory or expiratory quantities of air of the larger mammals. By means of a special valve, permitting a reversal of the recording mechanism, practically unlimited quantities of air may be made to pass in a continuous stream through this instrument. The vital capacities recorded closely approach the calculated normal values, and in several instances actually exceed them. The lesions were all well compensated for, although care was taken not to select these cases in a manner to favour the results. Hence, it is concluded by Burton-Opitz that a marked decrease in the vital capacity actually signifies cardiac decompensation, and that the percentage indicating its reduction may be employed as a measure of the failure to compensate. The assertion that this factor, embodying the vital capacity, portrays the condition of the patient more plastically than the blood pressure and pulse rate is questionable, he says, although it must be granted that it constitutes an important objective record in the diagnosis and prognosis of practically all cardiac disorders. It is to be emphasized, therefore, that the vital capacity does not suffer a material change in those "cardiacs" whose compensation is adequate.—*Jour. A. M. A.*, June 3rd, 1922.

Case Reports

BRONCHO-PNEUMONIA FOLLOWING ASPIRATION OF ZINC STEARATE POWDER

ALTON GOLDBLOOM, M.D.,

Montreal.

STEARATE of Zinc forms the basis of many dusting powders used for infants nowadays, and it is perhaps one of the very best powders for this purpose. Yet with its increasing popularity there have occurred in recent years from time to time, several accidents of a most serious nature, and not infrequently with a fatal termination. These accidents are due to the aspiration of the fine zinc stearate powder inducing a broncho-pneumonia with the most alarming symptoms. In all the cases the children had been allowed to play with the box containing the powder while the mother was changing or washing the baby. The case which I am about to cite which threatened for some days a fatal ending, is one of this type and will, I hope, emphasize the great danger that lurks behind a careless handling of an innocent looking dusting powder.

Baby M., 8 months old, was allowed to hold the box of dusting powder while his mother was changing him. The cover was not fastened tightly on the box and the baby, while shaking it, got some of the powder into his mouth. He gagged and immediately spit out most of it, but was at once seized with an irritating cough which came with each expiration. I was immediately notified of the occurrence by the mother who was not unduly alarmed at the child's condition. Previous experiences, however, had taught me that we were dealing with a very serious condition and I went at once to see him. By the time I arrived, which was not more than ten minutes after the accident, he was already almost exhausted with coughing, had rapid small pulse of 150, respiration about 60, with a short sharp irritating cough which came with each expiration. Gastric lavage with 1% sodium bicarbonate solution was done at once. This brought a little of the powder up from the stomach, and also caused him to cough up a small quantity from his lungs. The child was then put to bed, and the cough controlled with rather large doses of paregoric. At the end of 16 hours, respirations were 107 to the minute and the pulse 160, small and feeble. The temperature was only 99. Examination of the lungs showed the presence of broncho-pneumonia over the entire right lung behind, in the axilla and over the lower lobe in front, evidenced by fine crackles in these areas. Despite all this and despite the exhaustion of the child from the excessive respiration and the coughing, he was bright, interested in his surroundings, and carried to his mouth any object placed in his hands, quite forgetful of his experience of the previous day. Mustard paste every four hours to the affected parts, whisky in small doses, and continued administration of paregoric when the cough was troublesome were ordered for that day. The child slept but little during the next twenty-four hours, still his disposition was but little affected by his illness, so different in this respect from true bacterial pneumonia with fever and toxaemia. Toxeamia in this disease is noticeably absent and the temperature is rarely elevated; the distressing cough and the extremely rapid respirations were the salient features.

After 48 hours, the signs in the right lung remained unchanged, and now there appeared similar signs at the base of the left lung posteriorly. The pulse was now a little stronger, though quite as rapid, and the respirations were still well over 100 per minute while the child was awake, but dropped down to 60 per minute during his short intervals of sleep. Medication was continued as before.

On the third day, the respirations were 70 per minute, the pulse much stronger rate 120, temperature 100. The signs in the right lung had almost entirely disappeared while those in the left remained unchanged. It was now obvious that the patient was improving.

On the fourth day, the respirations were 50 to 60 per minute and the chest signs were clear except for a small patch at the left base posteriorly.

On the fifth day the respirations were 40, pulse 100, temperature 98 and the chest clear. The child has been well since.

The outstanding features in this case were the harrassing cough, the extremely rapid respirations, the moderate temperature reaction, the absence of toxic phenomena, the greater involvement of the right lung and the very rapid and complete recovery.

So far as I am aware, there have been no accounts in the literature of this condition, although some cases have been reported at the meetings of the Section on Pediatrics of the New York Academy of Medicine. Three such cases came under my observation in New York. The respirations in these were much more rapid than in the case which has just been cited. It is not at all uncommon to see respirations nearer 150 to the minute in this type of broncho-pneumonia. Possibly the paregoric given in this case served to control the rapidity of the respirations to some extent. The disease runs an almost febrile course, due to the fact that the penumonia is caused by an inert substance which produces an intense peribronchial and perialveolar leukocytic infiltration in an attempt to break up and carry away the fine particles of powder which have lodged in the lungs. Once this has been accomplished there is nothing to prevent a rapid return to normal. The reason for the greater involvement of the right lung is obvious and requires no explanation.

This case has been presented chiefly for the purpose of drawing attention to the serious consequences of aspiration of zinc stearate and to the increasing danger of the accident becoming more common with the growth in popularity of this dusting powder. Physicians should avail themselves of every opportunity of warning mothers against allowing their infants to play with the powder box; it is a common practice, as many mothers will admit and, as we have seen, is by no means without its dangers.

PHLEGMONOUS GASTRITIS WITH CIRRHOSIS OF LIVER

J. P. ANDERSON,

Former Assistant Pathologist, Toronto General Hospital

PHLEGMONOUS gastritis was first described by Benel in 1656. Up to 1904 Robson and Moynihan had collected 85 cases. In 1919 Sundberg was able to quote 215 cases of which 17 were under his supervision. Since 1919 five additional cases have been reported.

The case we have to report is especially interesting since none of the others mentioned were associated with cirrhosis of the liver.

History—The patient was a man aged 51 years, a coal miner and later a labourer, but he had been out of work for the past three months.

He had always enjoyed very good health save that one year ago he was sick in bed for one week, with an attack of acute abdominal pain with vomiting and later evacuation of tarry stools.

He had been up and about until Jan. 24, 1921. That night he felt chilly; Jan. 25 he was constipated and had pain about the umbilicus. Jan. 26 he vomited nearly all day. He could not eat anything and his bowels were obstinately constipated.

On Jan. 27th patient was admitted to hospital with severe abdominal pain and obstinate constipation of the bowels. Patient vomited once but there was no mention of the character of vomitus.

Both his wife and son said he had never been an alcoholic; at most, he might take an occasional glass of beer.

Physical Examination—Patient was an elderly male lying on his back with updrawn knees, breathing rapidly with sighing respirations, evidently quite shocked and suffering great pain.

Abdomen—Showed considerable rigidity (not board-like) of the rectus muscles. On percussion it was dull except over the stomach. Evidently considerable fluid in the peritoneal cavity. W. B. C. 23.000. Wasserman and blood cultures were not taken. R. 32, P. 126, T. 102. Patient became progressively worse and died the night of admission.

Autopsy—The peritoneal cavity was found to contain about 1 litre of dirty, pinkish grey, turbid, purulent fluid. There were flakes of fibrin over some of the intestinal coils and over the spleen. The peritoneum was moderately injected throughout.

The liver in the mammary line was about 6 cms. above the costal margin.

The stomach was distended with gas, the wall felt thickened, softened and pulpy.

The spleen weighed 710 grams. Its increased size was apparently due to passive congestion.

The liver weighed 1360 grams. It was very firm and the surface had a very markedly nodular appearance and feel. The nodules were all about the size of peas and the intervening areas were depressed and very fibrous.

The cut surface showed the capsule thickened especially over the depressed areas, and myriads of round nodules about the size of peas separated by strands of dense fibrous tissue.

Microscopically—The capsule bulged over masses of liver tissue and dipped down to become continuous with fibrous scarred areas about the portal radicals.

Throughout there were islands of several imperfectly formed liver lobules surrounded by a mass of fibrous tissue showing marked lymphocytic infiltration.

The liver cords showed a moderate amount of fat in medium sized droplets chiefly peripherally.

Gastro Intestinal Tract—The oesophagus showed several varicose veins. The stomach contained about 8 ounces of brownish turbid fluid. The mucous membrane was a dirty grey in colour and the rugae were absent.

The wall was markedly thickened to about 2 cms. and was soft and pulpy throughout. On squeezing, a yellowish fluid exuded from the cut surface.

About 2 and 5 cms. from the pyloric valve, were two healed ulcers each about 1 cm. in diameter. They were of the same colour as the surrounding stomach wall but the bases were depressed and the margins thickened and rounded.

The lymph glands of both the lesser and greater curvatures were moderately enlarged.

The remainder of the gastro intestinal tract was apparently normal. Microscopically—The submucosa was very markedly oedematous and somewhat necrotic and the entire wall was infiltrated with polymorphonuclear leucocytes from the mucosa out to the serosa which was covered with a fibrinopurulent exudate.

The entire wall was thus involved though the submucosa was more necrotic than the rest.

The lymph glands showed the lymphoid tissue relatively reduced in amount. The sinuses were very dilated and engorged with polymorphonuclear leucocytes, endothelial and plasma cells.

Bacteriology—A hemolytic streptococcus was isolated from the blood, the peritoneal cavity and from the stomach wall.

Discussion;—This, then, is a case of diffuse phlegmonous gastritis, occurring in association with a cirrhosis of the liver and induced by a hemolytic streptococcus.

Sundberg collected 95 cases in which the bacteriology was worked out and 71 of them showed streptococci.

Why the bacteria should select the stomach and how they gain access to the submucosal tissue is not definitely understood.

Sundberg quotes 17 cases which he personally examined, all of which showed a chronic gastritis with deficient gastric juice. Two cases mentioned had a coexistent carcinoma of the stomach and one had chronic nephritis. Only 25% of the cases had been alcoholics.

The case above had a marked portal cirrhosis with a resultant passive congestion of the organs drained by the portal circulation. This was demonstrated by the large passively congested spleen and the varicosed oesophageal veins.

The bacteria might reach the submucosa by the general circulation but it seems more likely that they enter through minute erosions of the mucous membrane.

In this connection it is interesting to note that at autopsy two healed ulcers were found which probably accounted for his illness and hæmorrhages of a year ago.

Undoubtedly, also, the passive congestion of the stomach would greatly reduce the resistance of the mucosa to infection and resultant erosion.

From Dep't. of Pathology, Toronto General Hospital.

BULLETIN OF HARVEY CLUB, LONDON

Infected Antra—Male, age 20, consulted a specialist because of a piece of foreign matter in the eye. He required instead an operation for drainage of both antra through the mouth. Ten days or so afterwards the patient was septic, with a large area of cellulitis extending from the face to four inches below the clavicle. This suppurated and was drained. Both parotids suppurated, one requiring drainage through the cheek. The spectacle of general sepsis, with pus from nose, mouth and an open abscess, with marked anemia and disability should cause one to hesitate before resorting to this operation until palliative measures have been tried. E. SPENCE.

Scarlatinal Septicemia—Case number 2980—Mrs. L. C. age 27, came from northern Ontario to be delivered at her father's home. Normal delivery except for moderate vomiting at the onset of labor and a tear of the perineum, which was immediately repaired, using chronic catgut. Temp. immediately after labor was 102 degrees with a pulse of 120. Death occurred 40 hours after delivery.

Her nurse developed scarlatina one week later; her baby had a double otitis media when it was a week old and two weeks later a suppurative mastoiditis; the nurse who attended the baby developed scarlatina.

From the above facts, one is forced to conclude that the mother became infected with scarlatina which precipitated labo: (3 weeks before the normal term) and which was the cause of death. Her baby was probably infected in utero, for so far as I know it was not nursed.—J. B. Mann, *Standard Medical and Surgical Clinic, Peterboro, Ont.*

Dislocation of Pisiform Bone.—E. L. male, age 25, slipped on waxed floor and fell on left hand. Region of wrist quite swollen and tender—motion very painful especially flexion and abduction. Pisiform bone quite movable and pressure on tendon of flexor carpi ulnaris very painful. The injury was put up in an anterior molded plaster splint and retained for three weeks. All soreness had disappeared but the bone can be snapped in and out quite readily and the power of flexion of the wrist is considerably less than normal. The case is inte esting because it is unusual, there being very few such injuries reported in the literature—only nine according to a recent compilation in Annals of Surgery. A. J. Grant.

Unusual Exanthem Resembling Measles in Infants.—Greenthal (*Amer. Jour. Dis. of Children*, January, 1922) describes an unusual exanthem in infants, preceded by high fever lasting three or four days. Eight cases were observed, the onset being sudden, with temperature ranging from 102° to 105° F., irritability, and refusal of food. Physical signs were absent, no cause for the temperature being discoverable before the appearance of the eruption. After three or four days the temperature fell suddenly, coincidently with the appearance of the eruption, which was chiefly macular, with some papules, and having the appearance of measles, but without any crescentic arrangement, and there were no Koplik's spots. The complaint did not seem to be contagious, only one member of each family being attacked. A leucopenia and a lymphocytosis of over 80 per cent. were important diagnostic signs during the pre-eruptive period. Measles is excluded by the absence of Koplik's spots, and by the fact that as soon as the eruption appears the temperature suddenly drops, leaving the patient apparently perfectly well. The eruption lasts for two or three days, being more pronounced on the neck and trunk than on the face and extremities, and it disappears spontaneously with very slight desquamation.—*Brit. Med. Jour.*, April 29th, 1922.

Artificial Pneumothorax.—Marais (*South African Med. Record*, January 28th, 1922) discusses the indications, scope, and results of therapeutic artificial pneumothorax from an experience of 38 cases during the past eight years. The ideal cases for treatment are those beyond the early stages in which the disease is confined to one lung, free from pleural adhesions, and therefore completely compressible. The usual method of treatment may be given a trial in early cases, but artificial pneumo-thorax should be considered when signs of ulcerative processes occur in the lung. In an otherwise uncontrolled toxæmia largely due to active processes in one lung, without evidence of active disease in the other, compression of the diseased organ yields quite dramatic results, the pyrexia disappearing, expectoration rapidly diminishing, and the appetite and general appearance improving. In severe or recurrent hæmoptysis the production of artificial pneumothorax acts rapidly, severe hæmorrhage having been checked instantly with permanently good results in at least three cases. Apyrexial cases, without chronic cavities and doing fairly well, should not be so treated unless a toxæmic recrudescence sets in; and the operation is contraindicated when cyanosis, dyspnœa, or long-standing emphysema and asthma complicate the tuberculosis. When lung collapse is prevented by one or two adhesions, section of them is possible, and when a whole lobe or two lobes are adherent a partial pneumothorax may be supplemented by rib section, but the presence of total adhesions necessitates a thorough thoracoplastic operation. Nitrogen is preferable to atmospheric air as minimizing the risk of infection through imperfect sterilization.—*Brit. Med. Jour.*, April 29th, 1922.

Editorial

IS THE GALL BLADDER A USELESS ORGAN

THE generally accepted practice of removing the gall bladder as the treatment of choice for conditions such as cholecystitis, cholelithiasis and chronic pancreatitis, has brought with it the need to determine the function, if any, of this organ and to estimate its value, when in a normal state, to the organism. To do this rationally we must know something of the origin and anatomy of the liver, gall bladder and bile ducts.

This gland and duct system is recognized early in embryonic life, as early as the 2.5 mm. embryo, as a ventral outgrowth from the lower end of the fore-gut. This outgrowth is at first a pouch from the alimentary canal, but soon becomes a solid mass of cells connected with the gut by a solid stalk. The beginning of the liver is soon formed from the main portion by the development of a branching outgrowth of tubules, while from the distal portion is differentiated what will later form the gall bladder and the cystic duct. The stalk becomes canalized to form the cystic and common ducts. By the time the embryo has reached the 29 mm. stage the gall bladder and cystic duct are formed; and the three layers of the wall may be recognized; *mucosa* from the original endodermal bud; *muscularis* from the mesodermal layer which has grown out over the ducts and bladder; *serosa*, a partial covering, from the primitive peritoneum.

In the human the gall bladder is a sac with a thin wall varying in thickness from $\frac{3}{4}$ mm when distended, to 2 mm. when contracted. It contains from one to 2 oz. of fluid, rarely more.

The mucosa is composed of simple columnar epithelium. It is thrown into folds which, by crossing form ridges and polygonal depressions. Under the epithelial layer, in the crypts formed by the folds, are found lymph follicles. The fibromuscular layer is composed of smooth muscle fibres and inter-lacing fibrous connective tissue bundles. The muscular element is nowhere very abundant and under the mucosa is almost absent. In this area there is a very rich plexus of blood and lymphatic capillaries. The blood supply comes from the hepatic artery through the cystic, and the veins empty into the portal vein.

The lymphatic supply is abundant, both the subserosa and mucosa are rich in lymph capillaries, and the surface of the gall bladder is well supplied with lymphatic vessels, some of which anastomose with the lymphatics of the neighbouring area of the liver; but most carry the lymph from the deeper layers of the gall bladder wall. They collect into larger vessels and drain into glands about the head of the pancreas and along the common duct. The nerve supply is derived from the sympathetic and from the vagus. Bainbridge and Dale, Freese and others have shown that it possesses both pressor and dilator fibres. The normal result of stimulation of the sympathetic is probably relaxation. Both inhibitory and pressor fibres leave the cord from the sixth to twelfth dorsal segments, the inhibitory towards the upper level, the constrictors towards the lower, but the areas overlap.

It has been proved that bile is constantly being secreted by the liver but at an inconstant rate. It is discharged into the duodenum scarcely at all while the stomach is empty; but freely during stomach digestion, as soon as the acid stomach contents begin to enter the duodenum. The discharge is closely parallel in time to the discharge of the pancreatic juice. Bile is secreted by the liver at a pressure up to about 300 mm. of water; at this pressure in the ducts, bile ceases to enter the bile channels and is diverted into lymphatics and the blood stream.

The rate of secretion lessens during resting and fasting periods. It increases during activity and during digestion. The quantity secreted varies considerably from day to day. The average in man is estimated at from 500-800 cc. according to some, up to 1200 cc. according to others. It has long been noted that the bile from the gall bladder is darker and more viscid than that from the ducts.

The natural assumption that the gall bladder acted as a reservoir for the storage of bile, and was capable of propelling it into the intestine during digestion when it was needed, is not as far wrong as might be supposed from reading some of the recent writers on the subject. It is true that the power of muscular contraction is not great; and that a tank with a capacity of 50 cc. cannot act as an ordinary reservoir for a 24 hour output of 800-1200 cc.; yet recent investigation shows that through its extraordinary power of absorbing fluid from the bile, bile salts can be stored up to a surprising extent, and that its contractile power under stimulation through the nervous system is real if not very strong.

Until recently there was little accurate knowledge of the power of contraction of the gall bladder or its action on the bile. Contractions of the gall bladder were observed and reported by Doyen as long ago as 1893. Freese in 1907 found that, under the conditions of his experiments, pressures of 216, 218, 214 mm of water could be demonstrated as the result of stimulation of the pressor nerves controlling the gall bladder musculature. He further demonstrated that both inhibitory and presser fibres left the cord from the 6-12 dorsal segments.

It is then clearly established that such contractions occur, that they can be initiated by stimulation of the controlling nerves: and that through this stimulation of the nerves, pressures approaching the

the outlet of the common duct. Nor should we forget in this connection Meltzer's belief in the reciprocating action of the nervous control of the sphincter of Oddi and the gall bladder muscle, by which it is brought about that when the sphincter of Oddi relaxes the gall bladder contracts.

It has been noted that some animals possess a gall bladder and some do not. Mann has shown that in animals which possess a gall bladder the sphincter opens at 100 mm of water, in those without at 30.

He and others have shown that the flow is intermittent in those with, but continuous in those without a gall bladder; and in animals from which the gall bladder has been removed the flow becomes continuous and the resistance of the sphincter low.

It is evident that as an ordinary reservoir, the gall bladder, with a capacity of 50 cc. for a daily production of 1,000 cc. of bile is quite inadequate, yet the secretion of bile is continuous and the output intermittent and confined largely to periods of stomach digestion.

The long recognized difference between gall bladder and duct bile led Rous and McMaster working in the Rockefeller Institute of Medical Research on a study of the concentrating activity of the gall bladder on the bile. Their results are published in a very interesting paper under that title in the Journal of Experimental Medicine, July 1921.

They first proved that bile from all parts of the liver was secreted at the same concentration during the same period of time. They then took advantage of the arrangement of bile ducts in the dog, which allows bile to be collected simultaneously from different parts of the liver. One portion was gathered in a rubber bag inside the peritoneum without any contact with gall bladder mucosa. The other passed into the gall bladder but was prevented from escape by ligation of the gall bladder more than normal and sometimes less, but that it was from 3.18 to 10.8 richer in bile pigment than the bile which had passed through the ducts without contact with the gall bladder. In other words the volume of bile had been reduced in some cases to $\frac{1}{10}$ of that secreted.

In a subsequent paper they prove that this concentrating action was present in the gall bladder alone and not in the bile ducts. The ducts on the contrary secrete into the bile a white fluid free from bile salts. Under conditions of obstruction of the ducts cut off from the gall bladder this "white bile" rapidly collects under a pressure sufficient to prevent the further entrance of bile into these blocked ducts; while in the obstructed ducts connected with the gall bladder a thick tarry bile gathers. Owing to the rapid withdrawal of water from the bile the pressure is maintained low enough to permit of the continued entrance of bile into these ducts

It is seen therefore that the gall bladder has several demonstrated functions and is not a vestigial organ to be removed at sight. It acts as a distensible bag to regulate extremes of pressure during rapid secretion from the liver during the periods of rest and fasting when bile is known not normally to enter the duodenum.

The capacity of the reservoir is made large enough to serve the need not by its size or ability to dilate; but by its power to reduce the volume of the bile, to store the bile salts and bile pigments at the expense of the watery part. In this way it can retain nearly all the liver output during the periods of rest and fasting. It has propulsive power sufficient to deliver bile to the duodenum when needed. This is an essential factor if the concentrating power is to have any meaning. Other uses it may also have, such as the addition of mucous as an element of protection to the pancreas in the event of bile being forced into its ducts.

That the organism can thrive seemingly uninjured after the removal of an organ is no proof of the uselessness of that organ, though it does permit of its removal when diseased. Clinical experience has shown that the gall bladder may be removed with safety to the health of the individual. A knowledge of its physiological usefulness, however, should temper our enthusiasm and steady our judgment as to when it should be removed and when preserved.

F. A. C. Scrimger

ON THE DIAGNOSIS OF TUBERCULOSIS IN CHILDHOOD

IN this number of the Journal appears a slightly abstracted report* on the X-Ray and clinical findings in normal chests of children from six to ten years of age prepared by a committee of experts under the direction of the American National Tuberculosis Association. This Association considered that such a report would be of great assistance in increasing the practical knowledge of physicians dealing with tuberculosis in children. We strongly commend it to the attention of every physician. In the June number of the *American Journal of Diseases of Children* Happ and Casparis of Baltimore present an interesting paper on the value of the intracutaneous tuberculin test in extensive tuberculosis. It is a general belief that skin hypersensitiveness to tuberculin is frequently lost in the presence of an overwhelming tuberculous infection such as general miliary tuberculosis, and tuberculous meningitis. Since the fact that skin hypersensitiveness to tuberculin implies that there is a focus of tuberculosis infection somewhere in the body, if the reaction fails in favour of tuberculous infection in which diagnosis is most difficult then the test loses much of its value. The Pirquet skin test is the one most frequently employed, and from the statistics published by reliable investigators it appears that negative reactions are obtained in at least 40 per cent of generalized tuberculosis. Better results are obtained from the subcutaneous injection method, and by the Mantoux method which allows the use of accurately measured amounts of tuberculin. This latter test will be found to yield results which can be depended upon. The amount advisable to use for the first test depends on the condition of the patient. Krause and Willis found that a general reaction of an anaphylactic character can be produced in non-tuberculous pigs after repeated injections, but no local tissue reaction was obtained. Hamberger was never able to obtain a local reaction from tuberculin in the non-tuberculous human being. On the other hand great care must be exercised when tuberculosis is suspected for not only may very severe local inflammation set in, but a general reaction may set in with marked activation of the tuberculous condition at the focus or foci of infection.

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*This report will appear in the August number.

For routine tests with children the authors commenced with 0.01 mg. at the first injection. Some patients, they say, will react to 0.001 mg., but a violent reaction following the injection of 0.01 mg. is most uncommon. This amount therefore was usually given as a routine measure for the initial injection when the forms of tuberculosis, which develop in the patient greater skin sensitiveness, were suspected such as tuberculous conjunctivitis or keratitis and superficial glandular, osseous, early pulmonary or renal infections. The next higher concentrations 0.1 mg. was employed as an initial injection only when a depression of skin sensitiveness might be assumed, as in general tuberculosis and tuberculous meningitis. Only occasionally in a patient with far advanced tuberculosis and extreme emaciation was more than 1 mg. tuberculin ever required to excite a reaction. The conclusions arrived at by the writers were the following. In miliary tuberculosis and tuberculous meningitis in infants and children the Pirquet cutaneous test was positive in over 50 per cent of their cases. A failure to react to the Pirquet test in miliary tuberculosis and tuberculous meningitis does not mean a loss, but only a depression of skin sensitiveness to tuberculin. The tuberculin test is quantitative: the Pirquet cutaneous test is equivalent to about 0.01 mg. tuberculin given intracutaneously. The intracutaneous test is more sensitive and affords a method of accurately measuring the amount of tuberculin given. If a high enough concentration of tuberculin is given intracutaneously, a positive reaction will be obtained in practically all cases of tuberculosis.

PASTEUR CENTENARY CELEBRATION

PASTEUR was born in May, 1823. Next year his centenary is to be celebrated at Strasbourg. The French Government and the scientific world of France are working actively to make the celebration a momentous one. National cooperating committees have been formed in many of the countries invited to participate.

In May, 1923, there will be at Strasbourg eminent men from all parts of the world. They will gather there in homage to the memory of a man whose genius made possible the many industries dependent upon accurate control of fermentation processes. With them will be joined those whose function it is to prevent and heal disease. Side by side, vinters, brewers, veterinarians and physicians will bear witness to achievements which remove much guess-work and add much knowledge to the practice of their occupations.

The ceremonies planned include the inauguration of a monument and the establishment of a department which will be devoted to the prosecution of Pasteurian studies.

Subscription lists have been opened in all the Universities of the world. Information concerning subscriptions and attendance at Strasbourg may be obtained from the Universities or from M. Th. Hering, 6, rue des Veaux, Strasbourg, the general secretary and treasurer of the French Committee. J. L. T.

Therapeutical and Pharmaceutical Items

PURIFICO

Several requests have come in for a report on this patent medicine, which is distributed by C. W. Diffin, manufacturing chemist of Buffalo, N. Y., and Bridgeburg, Ont., the successors to the Purifico Co., and E. E. Burnside, M.D. According to their booklet, Eleanor E. Burnside graduated from the New England Female Medical College class of 1867. The *Purifico News* definitely states that it cures Cancer, also that it cures Tumors, Goitre and all blood diseases. Both *Purifico News* and the book of *Evidence* contain letters from patients cured by taking these remedies. Letters written to two women whose letters are published in the *News* have brought answers. The letters are evidently not written by educated people. One of them has bought twenty bottles. The price is $5.00 per bottle.

There are three preparations, No. 1, 2 and 3. The bottles hold about 16 oz. They are dark, bitter, aromatic mixtures with a flocculent precipitate. They are described by *Nostrums and Quackery* (published by the A. M. A.), Vol. 2, 1921, p. 590. as follows:—

"*Dr. E. E. Burnside's Purifico*—Shipped by Charles W. and Pearl B. Diffin, co-partners, who traded as the Purifico Co., Buffalo. Samples of "Purifico Nos. 1, 2 and 3" were analyzed. "No. 2" was found to contain 10% of alcohol, with sugar, small amounts of glycerin, potassium iodid, cinchona alkaloids, piperin and emodin (probably senna). "No. 2" was found to contain 9% of alcohol, sugars, small amounts of glycerin, potassium iodid, cinchona alkaloids and piperin. "No. 3" was found to contain 14% of alcohol, sugars, valerian, piperin and tannic acid. All three products were falsely and fraudulently advertised. (Notice of Judgment No. 5896, issued May 14, 1918)"

The analysis of "No. 1" has been in part checked. It was found to contain alcohol, sugar, probably glycerin, potassium iodide. It seemed to contain valerian. The amount of iodide was small. It is obvious that the claims made are grossly exaggerated.

It is to be regretted that our laws are not such as to debar the sale of such preparations.

—V. E. Henderson, *Department Pharmacy, University of Toronto.*

STANDARDIZATION OF DRUGS

In the issue of April, 1922, p. 256, there was an outline of a plan by which important drugs, such as arsphenamine products, pituitary and digitalis, could be obtained of uniform composition for use by the physician. This plan entailed the department of health of the Dominion Government, undertaking the necessary physiological assays of such drugs and formulating regulations and standards for their quality.

On Wednesday, May 18th, a deputation from the Canadian Medical Association, consisting of Drs. C. F. Martin, W. G. Reilly, F. J. Farley, V. E. Henderson, J. Fenton Argue and T. C. Routley, waited upon the honourable Dr. Beland, minister of health, Ottawa, to urge upon the Dominion government, through the honourable minister, the adoption of the plan referred to above.

The deputation was introduced by Mr. Manley German, M.P. The minister of health gave the deputation a very sympathetic hearing. He, of course, realized that for the arsphenamine compounds there was at present no accurate control such as exists in the United States, where the department of health makes an assay of every batch produced by any manufacturer. It was pointed out that, under the "Food and Drugs Act," paragraph 14 (1), regulations could readily be introduced for its standardization. Paragraph 14 (1) says "The Governor-in-Council shall have the power to make regulations (a) prescribing standards of quality for, and fixing the limits of variabilities permissible in any article of food or drug, the standard of which is not prescribed by this act."

The minister also realized and pointed out to the deputation that he had experienced the unreliability of the ordinary tinctures of digitalis and had been forced to rely on an imported product if he wished to obtain constant therapeutic effects. It was pointed out that the deputation did not want to suggest that the manufacture of tinctures according to the B. P. standards be interfered with but that, if a tincture was to be described as "Standardized," it should be of definite physiological strength.

The deputation further pointed out that it would be a great step forward were the government laboratories to undertake for manufacturers these assays as the American government does for arsphenamine and would immediately protect the physician and the public.

Were physiological standards prescribed by regulation and were the department of health simply charged with sampling the market from time to time and with, as is the case with chemical standards for such drugs as liquor arsenicalis, ascertaining whether the standards were adhered to, it would be long ere the public and profession could be assured that the accuracy and strength of the preparations were such as they purported to be, while under the plan proposed the assurance would be immediate, as we have confidence that the Canadian manufacturer will not deliberately falsify his products.

The minister suggested that the deputation should have a talk with the deputy minister, Dr. Amyot. This the deputation did and were delighted to learn that the estimates for the department passed by the House this year included the salary for an assistant whose training would enable him to undertake this work and for the salary of an attendant. These are, of course, the heavy annual costs in carrying out this work. The other expenditures will hardly amount to more than two or three thousand dollars annually, while the capital cost of equipping a laboratory will hardly exceed five thousand.

The deputy minister assured the deputation that he would urge upon the minister the framing of the necessary regulations and the undertaking of the duty of the maintenance of the standards as soon as it was possible, He asked the profession in turn to give him honest and earnest support in his efforts to improve conditions in this matter as in other matters of health.

It may be further reported that several of the most important manufacturers of these bodies in Canada strongly approve of the steps we have taken and are ready to cooperate with us in our endeavours.—V. E. Henderson.

Bacterial Flora of Infants' Throats.—Bloomfield (*Bull. Johns Hopkins Hosp.*, February, 1922) has made a study of the micro-organisms present in the throats of infants by taking swabs from the throats soon after birth and at frequent intervals subsequently. He finds that cultures made within twelve hours of birth are almost always sterile, but that organisms begin to appear soon after nursing commences, and thereafter the throats of infants support a profuse bacterial growth. But the bacterial flora is relatively simple compared with that of adults; consisting of (1) a group of organisms of the staphylococcus group, introduced during the process of nursing, and corresponding to the organisms recovered from the skin of the nursing mother; (2) non-hæmolytic streptococci, which begin to appear within twenty-four hours and are present in great numbers—it is presumed that these are derived from the throats of attendants; (3) very occasionally a few diphtheroids and Grame negative cocci are recovered. The author points out that the bacterial flora of infants differs markedly from that of adults, from whose throats non-hæmolytic streptococci, Gram-negative cocci, and diphtheroids are constantly recovered, whilst influenza bacilli, pneumococci, and hæmolytic streptococci are relatively frequent in adults. The latter were never found in the throats of infants. Special conditions may be necessary for the colonization of these more pathogenic organisms, whereas the simple, non-hæmolytic streptococcus seems to have adapted itself completely to growth on the mucous membrane of the upper respiratory passages.—*Brit. Med. Jour.*, April 22nd, 1922.

Abstracts from Current Literature

MEDICINE

Impending and Real Gangrene Associated with Diabetes: Correlation of Medical and Surgical Effort.

Bernheim, B. M., *Am. Jour. Med. Sci.*, May, 1922.

The author draws attention, with illustrative cases, to the importance of combined medical and surgical consideration of patients with diabetes in whom gangrene threatens or already exists. He emphasizes the fact that in individuals suffering from diabetes, there is usually an associated generalized arteriosclerosis which, together with the recognized lowered resistance of the tissues to infection, may be said to prepare the field for those circulatory disturbances of the extremities that eventuate in gangrene. Of the two conditions, the lowered tissue resistance to infection is of primary importance. The patient's chances of surviving operation appear to be increased in proportion as his underlying diabetic malady is brought under control. The cases illustrate what may be accomplished by closely allied surgical and medical forces. The author, who is a surgeon, deprecates the fact that many surgeons endeavour to treat these surgical complications without respect to the medical conditions, thereby losing the opportunity for constructive measures. Whereas in gangrene from other causes, it may suffice to treat the local condition alone by re-establishing the circulatory balance in a limb of precarious circulation, by rest, baths and gentle massage, the case is entirely different in diabetes. Most of all the author refers to those cases of impending gangrene which have not progressed to the stage of actual tissue death.

The crux of the situation must, therefore, lie in the ability of the tissue to survive with a greatly diminished blood nourishment, and it is this ability which seems to be influenced by the diabetes. Careful medical treatment, then, is carried on prior to and parallel with the surgical measures, and the results have been most happy.

—C. F. Martin.

The Prevention of Simple Goitre in Man.

Kimball, O. P., *Am. J. Med. Sci.*, **May**, 1922.

The author enters fully into the nature of endemic goitre, and has gathered most interesting statistics to show how, as a public State measure, simple goitre may be prevented, and the direct application of this theory might in a few generations close the chapters on endemic goitre and cretinism in every civilized country in the world.

In the course of his article, he explains the investigations which have been made to show the relation of iodine to the thyroid gland, quoting from the work of many authors, chiefly that of Marine and Lenhart, as well as the later work of Kendall. Iodine is a constituent of the normal thyroid of all animals which possess the ductless thyroid. Experiments show that the store of iodine consists normally of inactive iodine for the most part in the cells, and of active iodine for the most part in the "colloid" or thyro globulin. Variations in the iodine store have been shown to have an intimate relation with the histology of the gland. Thus, in all species of animals with the ductless thyroid, the iodine store is decreased in the hyperplasias, and this decrease is proportionate to the degree of hyperplasia. Just so soon as the store of iodine falls below 0.1 per cent., active hypertrophic and hyperplastic changes in the thyroid begin. In other words, no functional hyperplasia, and, therefore, no goitre, can develop if the iodine store is maintained above 0.1 per cent. It may undoubtedly be rapidly and markedly increased by the administration of exceedingly small quantities of iodine in any known form and through a great variety of means, such as inhalation, enteral and parenteral administration, cutaneous application, etc., and as a result, marked histologic changes are brought about in hyperplastic glands, namely, the arrest of the hypertrophy and the involution or return of the thyroid cells to their resting form.

One of the first practical applications of the principle of prevention of goitre and myxoedema accidently followed the discovery of salt in Michigan, and its more extensive use (as crude salt) in the sheep industry of this State at a time when the industry was being crippled by endemic goitre. This crude salt was afterwards found to be rich in iodine. From this, and also from the application of the principle to prevent goitre in brook-trout, the investigators concluded that goitre could be prevented by adding a very small amount of iodine to the food or water, or by changing the diet and remedying the over-crowding of the fish.

At the Lakeside Hospital in Cleveland, similar experimental work on man was done for a period of ten years, and the results of the investigations have shown that the prevention of goitre was no longer an experiment but an accomplished fact.

The experiments in Cleveland were carried out in the public schools among girls, in whom goitre of the adolescent type is much more common than in boys. In April, 1917, an examination for thyroid enlargement was made of all the girls from the fifth to the twelfth grades inclusive and careful statistics were kept.

In 1688 cases or 43%, the thyroids were normal.

In 1931 cases, or 49%, slightly enlarged thyroids were found.

In 246 cases, or 6%, moderately enlarged thyroids were present.

In 7 cases, or 2%, the thyroids were markedly enlarged.

Adenomas were found in the remainder.

Prophylactic treatment was administered to more than 1,000 girls who had elected to take it. In not a single instance was a normal thyroid increased in those taking the iodine. In those not taking the iodine, 26% of those marked "normal" at the first examination showed definite enlargement. In the following year, a third examination of over 4,000 girls was made, while in 1919, over five thousand individual examinations were recorded, making a total for the entire period of 9,967 different girls, upon whom reports were given.

The prophylactic treatment as carried out consisted in the administration of 2 gm. of Sodium Iodide given in daily doses of 0.2 gm. every ten consecutive school days, repeated each spring and autumn. Statistical observations on this large number of girls manifested marked differences, both in the prevention of enlargement—prophylactic effect—and in the decrease in the size of existing enlargements—therapeutic effect. The tabulated results are very remarkable. Of the cases classed as "slight enlargements" and not taking the prescribed iodine, 13% underwent further enlargement; while among those taking the treatment, only 0.3% underwent any further increase in size. Of 2,000 cases not taking iodine, 500 showed thyroid enlargement. Of the group with small goitres, taking iodine, 57% returned to normal.

In the practical application of the preventive treatment, one must keep in mind the three periods when simple goitre enlargement most commonly occur, namely:—

(a) The foetal period

(b) Adolescence.

(c) Pregnancy.

The prevention of goitre in classes (a) and (c) is as simple as the prevention of goitre which develops during adolescence, and should be left to the individual members of the medical profession supplemented by the education of the public. The prevention of goitre in the adolescent period, on the other hand, should be a public health measure organized in the schools and in industrial medicine. The method and form of administration is a matter of little importance, for the thyroid gland will take up the iodine from the most stable compound.

The author adds an interesting note that in 1918, similar work was carried out in Switzerland by Klinger, whose published results of 16 months' treatment are equally remarkable, and all the more striking as the author worked in some schools in which the children were 100% goitrous. Here, too, the same plan for prevention has been recommended, for it has been amply demonstrated that if carried out as a public health measure, the prevention of endemic goitre can be successful in this—the most noted endemic goitre nation in the world. C. F. Martin.

Immediate Recovery from Early Diabetes Insipidus after Lumbar Puncture.

Tucker, J.: *Am. J. Med. Sci.*, May, 1922.

Few instances of complete recovery from diabetes insipidus after lumbar puncture have been recorded. As a rule, the polyuria and polydipsia which so frequently accompany the disturbances of the pituitary gland, are part of a clinical picture, insidious in onset and attended by other metabolic changes due to glandular dysfunction. Sometimes, however, this dysfunction may be due to some transient oedema or acute inflammatory process of a temporary nature, and under such conditions improvement by spinal puncture could be readily conceived.

In the author's case, there was a sudden onset of the diabetes insipidus without any preceding illness. There was some involvement of the second, fifth and eighth cranial nerves accompanying the discomfort behind the glabella, increased thirst and urine output, with marked sweating of the body. Within twenty-four hours after lumbar puncture, the thirst was relieved, the urinary output was reduced to normal and the sweating ceased. Five-and-a-half months afterwards, the findings were negative, with the exception of a high sugar tolerance. The author concludes that the case was one of incipient diabetes, due to some cause obstructing the normal flow of secretion without destroying the pituitary gland; the obstruction might be of the nature of a transient oedema, or an infection with resultant plastic exudate, or through some other extrapituitary condition such as increased intracranial pressure from any cause. The withdrawal of the spinal fluid tends to relieve this pressure and remove the obstruction.

It would seem from this experience that in any case of diabetes insipidus, the patient should be given the advantage of early relief by this means.
C. F. MARTIN.

On the Treatment of Gonorrhoeal Rheumatism. Ross, A. O.: *Edinburgh M. J.*, May, 1922.

The author discusses the use of electrargol. He draws attention to the well-known fact that infection of the joints is possible in the course of an acute urethritis at any time after extension of the disease to the posterior urethra. This usually occurs in the third or fourth week of the disease, but sometimes more rapidly, especially in alcoholic patients. He discusses the various methods of treatment of gonorrhoeal infection, both locally and systemically, and finds satisfactory results in thirty cases of arthritis in the use of a combined chemical and rational vaccine treatment; the chemical substance used was colloidal silver in the form of "electrargol" and mixed vaccine containing 500 million gonococci per c.cm., together with staphylococci, streptococci and B. coli.

Isotonic electrargol is a dark-brown, almost opaque fluid containing silver in colloidal solution. The dose recommended is from 10-20 c.c. intravenously. The patient is put to bed for the treatment, and given 15 grs. of ac. acetosalicylic immediately before the injection and again four hours later. A reaction follows within two hours of the injection, after six hours, the patient, who may have had a stormy time at first, becomes free of all ache and pain on movement, and the general condition is much improved. On the following day there may be evidences of what seems like a relapse, but after the second injection forty-eight hours later, the improvement is more manifest. The author recommends the further use of injections at 2-daily intervals, combined, of course, with local treatment of the prostate, and use of vaccines. He prefers using 5-10 c.c. rather than the larger dose, and finds that under such conditions, the evil effects ascribed to the drug are practically nil. C. F. MARTIN.

Rheumatoid Arthritis: Recovery After Being Bedridden for Four and a Half Years. Hurst, A. F., and Osman, A.: *Proc. Royal Society of Medicine*, May, 1922.

The author draws attention to the importance of combining orthopaedic treatment of chronic arthritis with psychotherapy. The case recorded was that of a man with marked deformity of hands and feet, causing him to be bedridden for four-and-a-half years. There was extreme deviation of both hands, and the fingers were fixed in a flexed position; the knees were drawn up and firmly fixed, with great wasting and shortening of the ham-strings. Tenotomy of the hamstrings was performed and the legs fixed in plaster. The fingers and toes were subjected to a gradual extension by means of metal splints fitted with rubber extension bands. The patient, having been unable to move his hands and feet on account of the pain during the active stage of the disease, had lost all power in his muscles. This functional paralysis was rapidly overcome by persuasion and re-education. Eight months later he was able to walk about without pain or difficulty, and has since returned to work. Though there is obvious deformity of the hands still, nevertheless, he can move his fingers well and is able to write; he can walk long distances without undue fatigue, and his gait is quite normal. C. F. MARTIN.

Praesystolic Murmurs in Rapid Hearts Simulating Murmurs of Mitral Strenosis. Jones, E. E., and Jennings, A. F., *J. A. M. A.* April, 1st, 1922.

The authors report four cases exhibiting in life praesystolic bruits with and without praesystolic thrills in whom at autopsy no narrowing of the mitral orifice could be detected.

Case I—Definite short praesystolic murmur; no thrill; no enlargement; normal blood pressure; pulse rate 85-94. Subjectively, there were pains, dizziness, and dyspnoea on exertion. Subsequently developed septicaemia as complication of suppurative pleurisy. Autopsy revealed a heart in every way normal.

Case II—A soldier with history of pulmonary tuberculosis. Examination discovered short praesystolic murmur and accentuated second sound in the pulmonic area. Pulse rate was 112 to 120. No thrill and no evidence of enlargement. Subsequently death took place suddenly in the course of a sero-fibrinous pleurisy. Autopsy showed a normal heart in every way.

Case III—Patient suffering from active pulmonary tuberculosis. Praesystolic bruit rolling in character, and blowing systolic at apex. Accentuated second sound in the pulmonary area. Praesystolic thrill at the apex. Left border 10.5 c.m. from mid-sternal line. Death subsequently from miliary tuberculosis. Postmortem the heart was of normal size; there was no narrowing of the mitral orifice.

Case IV—Young woman suffering from heart failure—dyspnoea, praecordial pain, oedema, albuminuria of four weeks duration. There were rumbling praesystolic murmur, praesystolic thrill, and a systolic bruit at the apex. Left border 17.5 cms from mid-sternal line. Blood pressure 180-122. Pulse 122. She improved during ten days, oedema and dyspnoea becoming less and the praesystolic murmur disappearing. Death occurred suddenly in bed. At autopsy there was no narrowing of the mitral ring. There were thickening of left ventricle, sclerosis of coronaries and the aorta. and a healed infarct near the apex; also evidence of healed fibrinous pericarditis without adhesions.

The authors mention recent articles in the literature which emphasize frequency of praesystolic apical bruits in patients without stenosis of the mitral orifice, notably in aotic insufficiency (Flint Murmur), in adherent pericardium, and in accelerated hearts which are structurally perfect.

The Prognosis of Involution Melancholia, Hoch and MacCurdy. *Am. J. Psych.* Vol. I., No. 3, Jan. 1922.

Contrary to the generally accepted idea concerning the prognostic hopelessness of involution melancholia, the authors point out that a fair proportion of these sufferers recover. After reviewing the teaching of Kraepelin and Dreyfus, they classify involution melancholia as distinct from the manic-depressive group. Nosologically and prognostically, they divide the symptoms into two groupings—the benign, which tends toward recovery in one to four years and the chronnic-malignant which ends in death without improvement.

The latter group is characterized by (1) a ridiculous hypochondria. (2) marked peevishness with autoeroticism and (3) loss of affective response.

In summary, the authors state, "The result in a series of 67 patients, in whom the final outcome was determined in all but one case, cause us to conclude that patients with involution melancholia, recover unless they show as dominant symptoms: marked insufficiency of affect, peevish or auto-erotic behaviour, or ridiculous hypochondriacal delusions which usually are concerned with the alimentary tract. These prognostically bad symptoms may be present for a short phase of the psychosis in women at the menopause without their prejudicing the outlook for recovery. All patients who eventually recover show some improvement within 4 years after the onset. The others run a chronic course or die un-improved."

F. H. Mackay.

The Value of Phenobarbital (Luminal) in the treatment of Epilepsy. *Cheinesse. L., Presse Med.* (Jan. 14.), 1922.

The author cites his experience in the use of luminal in the treatment of epilepsy, which, on the whole, is critical of the too optimistic attitude surrounding its use.

In many cases of grand mal, there was no appreciable effect while in petit mal the effect was not too encouraging.

Its sudden withdrawal has resulted in status epilepticus while intellectual torpor and, in some cases, delirium, have followed its use.

The torpor and lassitude may be beneficially influenced by combining with the luminal, small doses of belladonna, as suggested by M. Ducoste.

—F. H. Mackay.

SURGERY

On Delayed Union and Non-union of Fractures. Nutter, J. Appleton. J. *Bone and Joint Surg.*, Jan., 1922.

Delayed union means a retardation of the process of normal consolidation of a fracture, and may exist up to six to twelve months following the injury. Non-union means that consolidation is absent and is no longer to be hoped for, save by operative means. Delayed union in general calls for non-operative treatment with good hope of success, while non-union implies operation of necessity. Delayed union occurs in about one and one-half per cent of all fractures, while non-union occurs in about two to three per cent.

Causes of Delayed and Non-union.—Almost every known malady has been considered a constitutional cause, but the importance of them all, with the probable exception of syphilis, is largely academic. Local conditions are on the other hand of the highest importance. (1) Non-apposition of the fractured bone ends due to loss of substance or to over-riding. (2) Interposition of soft parts between the fragments. (3) Faulty immobilization, including immobilization for too short a period. Too much handling by an impatient surgeon. (4) Sepsis, generally acting through extensive necrosis and bone abscess. (Note, per contra, that mild sepsis has been found to promote callus formation.) (5) Bone tumours, as sarcoma and metastatic carcinoma, also bone disease of all kinds at the seat of fracture, syphilis, tuberculosis, bone cysts, acute rickets, etc. (6) Defective blood supply by too tight bandaging or splinting, and by rupture of the nutrient artery. (7) In some cases no cause whatever can be found, as in the refusal to unite of some cases of osteotomy for bow-legs. (8) Metallic plates, nails, and screws at times cause delayed and even non-union. By the irritation of their presence they delay callus formation.

Diagnosis.—Delayed union is to be diagnosed when, following a fracture, consolidation is found to be weak after a period which usually suffices to effect union. Non-union ordinarily is to be diagnosed only after six to twelve months of treatment directed towards promoting consolidation of the fracture. A very common error is to diagnose as non-union, and therefore treat by operation, a condition where in reality union is only delayed and where, with patience, consolidation will be effected by conservative measures alone.

Treatment.—Broadly, that of delayed union is conservative, while that of non-union is operative.

Treatment of Delayed Union.—Any constitutional disease, as syphilis, is to be treated vigorously. Avoid stirring the bone-ends about to see how the case is doing. Get good apposition, good immobilization and good alignment and the great majority of cases will unite. Do not put recently healed fractures to work too soon, especially in Pott's fracture and femurs. Be sure the splints are not too tightly bandaged. If, after three months, union in a femur, for instance, is weak, use Thomas's percussion and damming method. Break down the soft callus, turn the bone ends towards the skin and beat them with a padded mallet, then apply a rubber bandage above and below the fracture, inducing venous congestion for from half an hour to several hours daily. Baking and massage, with hydrotherapy are stimulating. Electricity and the injection of irritants such as iodine, zinc chloride, etc., would seem of little service. Drilling down upon the bone ends is an old form of local irritation now being revived with success. In leg cases ambulatory splints are of much service, whether their action is by promoting the blood supply or by rubbing the bone ends together.

Treatment of Non-union in Aseptic Cases.—Where soft tissues are interposed these must be removed. Where there is gross loss of substance the gap must be bridged or length of limb sacrificed. The key-note of operation should be simplicity. Get bleeding bone-ends in apposition and keep them together by an absorbable suture, if possible. Immobilize with the greatest care. The sclerosed bone-ends will have to be freshened and the bones drilled longitudinally to free the imprisoned osteoblasts. In the larger bones where there is considerable loss of substance the method of choice is the Albee bone graft, which must extend into healthy bone both above and below. Sir Robert Jones avoids the use of plates and metallic sutures. Sir Arbuthnot Lane uses them. Non-union of fractures of the femoral neck is the rule rather than the exception. Pegging the femoral neck together with refreshing the bone ends through an anterior incision seems the favorite procedure, and one that has met with considerable success. A bone peg is to be preferred to a metallic spike. In the case of the smaller bones, notably the radius and ulna bone grafting has had many failures owing to an over-estimation of the power of callus formation in small bones. A small medullary graft of rib or iliac crest does well here, sprung into place. Tapering bone ends are to be split and the graft engaged in their cleft extremities.

Sepsis in Delayed and Non-union.—Sepsis is a cause of delayed but not commonly of non-union. Callus formation, after the first flare-up, is abundant. Three to five months after the fracture septic tracts should be excised, sequestra got rid of and the bone-ends refreshed, even in the presence of mild sepsis. Metallic sutures and plates should not be used, as they act as foreign bodies. Before the war, union of septic bone-ends was considered hopeless, we now confidently expect it. Bone grafting should not be attempted in the presence of sepsis, or after it, until it is certain that no latent infection exists.

J. A. Nutter.

News Items

NOVA SCOTIA

REPORT OF HALIFAX HEALTH COMMISSION

The clinical activities of the Health Centre and the field activities of the Massachusetts-Halifax Health Commission as summarised by the Chief Nurse for May show a total of seven hundred and thirty-four medical and nursing consultations.

Two hundred and nineteen admissions were registered among those seeking medical advice and treatment and one hundred and eighty of those previously attending clinical services were discharged from the clinic rolls, the majority of them being continued in the home teaching services of the public health nurses.

Public health nurses from the Health Centres of Halifax and Dartmouth during May made a total of three thousand, two hundred and six visits in a total of twenty-three hundred and fifty-six homes.

The total number of babies under two years of age receiving medical and nursing guidance total eight hundred and seventy

The Laboratory staff studied thirty-three samples of the public water supply: forty-six specimens of sputum: thirteen of urine; forty nine samples of blood to determine the Wassermann reaction: and one sample of milk, and performed other routine work.

The Scotia Pure Milk Company and the Farmer's Dairy Company each are supplying milk to necessitous people free of cost, on written recommendation of the nursing staff.

Two public addresses have been given during the month by nurses connected with the staff. One by Miss Ross on the 1st at the May Fair for the Coloured Children's Home; and one by Miss Fenton on the 19th to the Girl Guides and Brownies of Trinity Church.

The clinical activities of the Health Centres and the field activities of the Massachusetts-Halifax Health Commission as summarised by the chief nurse for the month of April show a total of 671 medical and nursing consultations. Of these, 124 were in the child welfare and prenatal service; 80 in the preschool age dental service; 157 in the nutrition classes; 5 in the posture clinic; 7 in the eye clinic at Dartmouth, 52 in the ear, nose and throat services; 99 in the tuberculosis clinic services; ten in the skin clinic; 18 in the pre-school nutrition clinic; and 119 in the venereal disease clinic conducted by the Provincial Department of Health. One hundred and thirty admissions were registered among those seeking medical advice and treatment; ninety-one of those previously attending clinical services were discharged from the clinic rolls during the month, the majority of them being continued in the home teaching services of the public health nurses. At the end of the month there remained on the rolls a total of 2,067 patients who were receiving medical and nursing supervision from the Health Centres.

In summarizing the field work this report sets forth that public health nurses from the Health Centres of Halifax and Dartmouth during April made a total of 2,160 visits in a total of 1,433 homes. In addition, the visiting house-keeper made fifty-five instructional visits into 28 families where nutrition problems were paramount. The total number of babies under two years of age receiving medical and nursing guidance total 864. The medical examiner in tuberculosis studied nine cases of tuberculosis in consultation with family doctors; in addition, conducted a total of fourteen clinics, making forty-nine complete chest examinations in connection with these clinics; made eight detailed examinations at the Tuberculosis Hospital, performed five operations in the Hospital for Pneumothorax; and at the request of the Anti-Tuberculosis League of St. John, N. B., assisted in a case finding campaign where 120 complete examinations were made from the 4th to the 7th. The Preschool Dental Clinic reported a total of 77 consultations, at which 498 operations were performed, and 699 treatments given, and a total of 101 extractions under gas-anaesthesia and four without. No deaths occurred during April of any babies under two years of age under the supervision of the public health nurses. Six public addresses have been given during the month by nurses connected with staff. During April St. John Ambulance resumed teaching of classes at the Health Centre both in First Aid and Home Nursing: these classes will be conducted weekly.

At the annual meeting of the Colchester-Hants Medical Society after the routine business was finished the following papers were presented:—"Clinical and Laboratory Co-relation, including some recent Developments," by Dr. J. G. McDougall, Halifax, N. S.; "Ethics of Organization," by Dr. S. L. Walker, Halifax, N. S.; "Life Insurance Examination Fees," by Dr J. W. T. Patton, Truro, N. S.; "Blood Transfusion," by Dr. D. S. McCurdy, Truro, N. S.; Case Reports, by Dr. J. W. Reid, Windsor, N. S., and Dr. E. E. Bissett, Windsor, N. S.

The officers elected for 1922-23 were as follows:—president, Dr. F. R. Shankel, Hantsport, N. S.; vice-president, Dr. D. S. McCurdy, Truro, N. S.; secretary-treasurer Dr. H. V. Kent; executive, Drs. R. O. Shatford, F. F. Eaton and C. H. Morris.

At the annual meeting of the Valley Medical Society held at Wolfville on Monday, Digby was selected as the place of meeting next year. This society is comprised of members of the medical profession in the counties of Kings, Annapolis and Digby and meets semi-annually, the summer meeting being the annual meeting. On Monday the election of Officers resulted as follows: President—Dr. Read, Digby, N. S.; Vice-President—for Digby County—Dr. Campbell, Bear River, N. S.; Vice-President for Annapolis, Dr. Phinney, Lawrencetown; Vice-President for Kings—Dr. Burns, Kentville, N. S.; Secretary-Treasurer—Dr. Sponagle, Middleton, N. S.; Middleton was selected as the place of the mid-winter meeting. The programme Monday consisted of:—

Addresses, Dr. J. G. McDougall: Subject "Applied Psychology in Medicine and Surgery.

Paper, Dr. C. E. A. DeWitt. Subject: "Preventive Medicine as prescribed at Acadia Institutions."

"The Ethics of Organization", Dr. S. L. Walker, Associate Secretary Nova Scotia Medical Society.

From 5 to 7 o'clock the members and their wives were guests of the Wolfville medical men and their wives at a garden party on the grounds of the Westwood Hospital.

ONTARIO

Dr. J. Gibb Wishart has resigned the Chair of Oto-Laryngology in the University of Toronto medical faculty, a position which he has held for 37 years. He is succeeded by Doctor Perry Goldsmith.

Dr. B. P. Watson, having accepted the Chair of Gynaecology and Obstetrics at the University of Edinburgh, resigns from the Faculty of Medicine in Toronto. He will be succeeded by Dr. W. B. Hendry. Dr. W. H. F. Addison has been appointed Associate Professor of Anatomy in the University of Toronto Medical Faculty. Dr. R. D. Defries has been appointed Associate professor of hygiene in the University of Toronto and is acting as head of the department during the absence of Professor Fitzgerald in California.

A Canadian society of Paediatrics was organized at a meeting in Toronto during the month of June. Dr. Blackader of Montreal was elected as the first president of the organization. Dr. Allan Brown, of Toronto, and Dr. Morgan, of Toronto, were elected vice president and secretary-treasurer respectively. Dr. H. P. Wright, of Montreal, Dr. Canfield, of Toronto, and Dr. G. Campbell, of Ottawa are the members of the executive committee.

The Western Ontario Academy of Medicine held its final session for 1921-22 in the Medical School Auditorium at 2 p. m. sharp, on Tuesday, May 23. The programme was furnished by Dr. W. C. Bowers, of Bellevue Hospital, New York, who spoke on the subject of Otitis Media, from the standpoint of the general practitioner. This was followed by an address with lantern demonstration of the commoner diseases of the skin, by Dr. G. C. Campbell, of McGill University and Montreal General Hospital. A skin clinic, of a considerable number of cases, was also presented, of features, diagnoses and treatment indicated. Dr. H. O. Foucar, of the Department of Paediatrics, of the Mayo Foundation, Rochester, Minn., gave an interesting paper on the subject of "Respiratory Manifestations in Encephalitis Lethargica in Children." illustrated by lantern pictures. A noon-day luncheon preceded the general meeting. Geo. A. Ramsay.

The last meeting of the Harvey Club was held at Westminster Hospital on Wednesday evening April 26th, Dr. McGhie and his staff gave a program of which the following is a short resume: 1—Dr. McLean read an excellent paper on general paresis and presented 9 cases illustrating the 3 stages of the disease—3 early, 3 intermediate and 3 late stages. 2—Dr. Campbell outlined the treatment of G. P. I. used at the Westminster Hospital. 3—Dr. Horne read a paper on epilepsy and presented a number of patients, among whom was a patient with traumatic epilepsy, due to a depressed fracture in the right parietal region, which was demonstrated by the X-ray plate as well as by palpation. The heartiest thanks of the Club were extended to Dr. McGhie and his associates.

TO THE PHYSICIANS PRACTISING IN ONTARIO

Spadina House,
Toronto, May 1, 1922.

Dear Sir:—

For some time the Department has been endeavoring to improve registration of births in Ontario by making appeals to physicians to issue their "Notices" in all cases.

Notwithstanding these efforts, approximately ten to fifteen percent of births are unregistered, and the Department has come to the conclusion that the only plan whereby these notices can be secured is to institute legal proceedings against physicians neglecting this duty.

You are, therefore, herewith instructed to forward to this office, along with your monthly returns, a list of physicians who fail to forward the "Physician's Notice" within 48 hours after the date of the birth, giving specific instances of such neglect with names, dates, etc.

It would be advisable that you notify all physicians—through the press or otherwise—practicing in your municipality that you are so instructed and that failure to furnish the aforenamed "Notice" will involve prosecution.

Yours truly,
John W. McCullough,
Deputy Registrar-General.

TO THE PHYSICIANS OF TORONTO

May 22, 1922.

The Department of Public Health has for some time been considering plans by which a still further reduction of diphtheria in the city might be brought about.

Since the introduction of the method of developing an immunity to diphtheria by the toxin-antitoxin method, the results have been closely followed, and the Department now feels that it is in a position to make recommendations in relation to this method of conferring immunity.

In spite of the exceptional facilities provided to aid in the diagnosis of diphtheria and the fact that in diphtheria antitoxin we have a specific cure, if administered early and in sufficient dosage, we still have each year a large number of cases and deaths. For the past few years the case mortality rate has remained approximately the same. In 1919 it was 7.8 per 100 cases, in 1920—9.9 and in 1921—5.4.

A most important fact is that of all the reported cases in 1921, an average year, 22 per cent occurred in children under 5 years of age. The case mortality for this group was 12.5 per 100 cases, as compared to 4.4 in children from five to fourteen years and 1.1 per cent in the group of fifteen years and over.

Considering the above figures, it is evident that while it is important in any home in which a case of diphtheria occurs that the contacts should be given an immunizing dose of diphtheria antitoxin, it is particularly important when those contacts are children under 5 years of age.

As to toxin-antitoxin immunization, we believe that our chief effort should be directed to the children of preschool age. As nearly all of these children are susceptible to diphtheria, they can be immunized without previous Shick testing and the reactions in this group are practically always mild.

If children of school age are to be immunized they should be previously Shick tested as a fairly large percentage are by this time immune to diphtheria and therefore do not need further immunization.

Adults should only be immunized when their Shick test is positive and they themselves desire the immunization.

To facilitate this work the Provincial Board of Health through the Local Board of Health, is distributing the material prepared by the Connaught Laboratories for both the Shick test and the toxin-antitoxin immunization. These preparations may be obtained by any physician at the City Hall.

Further, to meet the needs of those unable to pay, or those patients whom physicians would prefer not to deal with themselves, clinics will be opened at the Isolation Hospital, the Hospital for Sick Children and the Women's College Hospital.

If this effort to secure the immunity of our population from diphtheria is to succeed, it must have the support of (and be carried out by) the medical profession. This letter is addressed to you, trusting that your support (and active co-operation) will be given to our efforts to further the control and prevention of diphtheria.

Sincerely yours,
Chas. J. Hastings,
Medical Officer of Health.

OFFICERS OF THE ONTARIO MEDICAL ASSOCIATION. 1922-1923.

The Officers of the Ontario Medical Association for the ensuing year are as follows:—

President—E. R. Secord, Brantford.
1st Vice-President—J. F. Argue, Ottawa.
2nd Vice-President—Geo. S. Young, Toronto.
Treasurer—G. Stewart Cameron, Peterborough.
Secretary—T. C. Routley, 127 Oakwood Ave., Toronto.

Counsellors

District 1.—R. G. R. McDonald, Sarnia
" 2.—Weston Krupp, Woodstock
" 3.—T. H. Middlebro, Owen Sound
" 4.—F. W. E. Wilson, Niagara Falls
" 5.—Robert T. Noble, Toronto
" 6.—E. A. McQuade, Trenton.
" 7.—John Sparks, Kingston
" 8.—Hugh Laidlaw, Ottawa
" 9.—Edgar Brandon, North Bay
" 10.—John Pratt, Port Arthur

The next annual meeting of the Ontario Medical Association will be held in Windsor, under the auspices of the Essex County Medical Society.

The dates will probably be May 29th, 30th, 31st, and June 1st, 1923.

Plans are already being made to make the 43rd annual meeting a real success.

THE FORTY SECOND ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION.

The 42nd annual meeting of the O. M. A. which was held in Toronto during the week of May 29th was in every particular most successful.

From point of view of weather, attendance, programme and social activities the week left nothing to be desired.

It is quite possible that the record attendance of members (640) was in no small manner influenced by the delightful summer sunshine which was unbroken until Friday afternoon, the last session of the convention.

The opening address in Convocation Hall on Monday evening was well attended, between four and five hundred people being present to hear Dr. Macfie Campbell of Boston on the subject of "The Modern Conception of Mental Disease." The large lay audience evinced quite as much interest in the subject as did their medical friends.

Tuesday was given over entirely to business. The directors met at 10'clock, adjourning at 11, at which hour the Committee on General Purposes convened. Most of the affiliated societies were represented and the record attendance of seventy five members of the committee was reached.

The business programme containing 22 reports had previously been mailed out to the members, a point worthy of note, as the work of the committee was thus greatly facilitated and the various items of business dealt with thoroughly and intelligently.

At 6-30 p. m. upwards of 100 sat down to the "Round Table Dinner" which was followed by a "Round Table" discussion presided over by Dr. J. W. Crane of London. Upwards of 40 participated in discussing the report of the Inter-relations Committee and the short paper presented by Dr. V. E. Henderson on the relation of the physician and druggist to each other, and to the public. The "Round Table" evening again proved itself worthy of a permanent place on the programme.

After the association had dealt with the general business on Wednesday morning, two excellent papers were presented by Dr. Allen Krause of Johns Hopkins, Baltimore, on "The Changing Face of Tuberculosis" and by Dr. Reuben Peterson, University of Michigan, on "The Advantages of Gas Inflation in Obstetric and Gynaecologic Diagnosis with Especial Reference to its Importance in the Study of the Causes of Sterility."

The afternoon was given over to the six sectional meetings and clinics, some twenty seven men being listed to participate.

The association dinner held at the King Edward Hotel on Wednesday evening, and to which the ladies were invited, was a great success. The attendance was close upon 375, the cuisine excellent, the music bright and cheery, the presidential address by Dr. F. J. Farley, an interesting oration sense, while the final part of the programme, a radio-telephone concert, was both unique and entertaining.

On Thursday at mid-day in Convocation Hall close upon 500 gathered to listen to the address in medicine by Dr. Thos. McCrae of Philadelphia.

At the sectional meetings during the day 40 speakers were listed to take part in ten sessions.

From four to six o'clock Dr. and Mrs. Herbert Bruce entertained the members and their wives at a most delightful garden party at their home.

Thursday evening was an open night for class reunions and according to reports was taken advantage of by many.

The address in surgery was given at 11:30 a. m. on Friday by Dr. Neil John McLean, Winnipeg. The rest of the day was in turn given over to sectional Meetings, at which 27 were listed to participate.

Particularly worthy of mention was the unique session held at the Pathological Building of the University of Toronto where 12 demonstrations in pathology and clinical laboratory methods were held. The attendance was large and judged by the interest manifested, the entire programme was highly appreciated.

The Convention came to a close on Friday afternoon, the last session being a conjoined meeting of the sections of medicine and surgery on the subject of Empyema and abscess of the lung.

Before the meeting closed votes of thanks were fittingly tendered the university authorities for the use of the buildings, the Academy of Medicine, Toronto, (hosts of the meeting), Dr. and Mrs. Bruce for their kindly hospitality, Drs. Noble and Jordan, the indefatigable Committee on Arrangements, and all the officers and contributors who made the programme one of outstanding merit and interest.

CANADIAN SOCIETY FOR THE STUDY OF DISEASES OF CHILDREN

The first week in June saw the birth of another medical society which is to be Dominion-wide in its scope. On the 2nd of the month a number of physicians from the provinces of Quebec and Ontario met at the Hospital for Sick Children, Toronto, and laid the foundation of what will be known as "The Canadian Society for the Study of Diseases of Children." It had long been felt that the formation of such a society was necessary in view of the rapidly increasing interest shown by the physicians of the Dominion in this particular field of medical science.

Those present at the meeting were: Drs. A. D. Blackader, L. M. Lindsay, A. Goldbloom, H. B. Cushing, H. P. Wright, Montreal; Dr. Geo. Campbell, Ottawa; Dr. Crossan Clark, Hamilton; Drs. Alan Brown, A. Caulfeild, Geo. Smith, Geo. Pirie, Geo. Boyer, Bev. Hannah, A. P. Hart, E. H. Morgan, Toronto.

Dr. Blackader, as Chairman, opened the meeting with a short address in which he outlined the aims abd activities of the proposed society. The actual drafting of by-laws and Constitution was left to the officers and council, but many suggestions were made and recorded regarding the details of the constitution and by-laws, and will be forwarded to the council for consideration at its first meeting.

The society will, if these suggestions are carried out, be independent of any other medical association: it will consist at first of not more than fifty members of whom the majority will be paediatrists. Physicians in other branches of medicine, whose work has a close relation to the field of paediatrics and child welfare generally will also be eligible.

The officers elected were: President: Dr. A. D. Blackader, Montreal. Vice-President: Dr. Alan Brown, Toronto. Sec.-Treas.: Dr. E. A. Morgan, Toronto. Councillors: Dr. H. P. Wright, Montreal; Dr. Geo. Campbell, Ottawa; Dr. Alan Caulfeild, Toronto.

The officers and members of the newly formed society were entertained at a dinner given by the vice-president, Dr. Alan Brown, after which there was a general discussion relating to the new organization.

BRITISH COLUMBIA

Dr. T. J. McPhee has recently been appointed Medical Officer of Health for Nanaimo, V. I.

To those few members of the profession who have not yet joined the British Columbia Medical Association we would ask them through the medium of this Journal, which enjoys a large circulation in this province, to send in their application for membership at the earliest possible moment. The annual meeting of the Provincial Association will be held during the week ending August 26, 1922.

The annual meeting of the Vancouver Medical Association was held on April 24, 1922, when the following officers were elected for the ensuing year. Dr. J. J. Mason, president; Dr. F. J. Buller, vice-president; Dr. H. H. Milburn, secretary and Dr. Stanley Paulin, treasurer. A special meeting of the same association was held on May 18, when the letter of the British Columbia Medical Association to the Workmen's Compensation Board was endorsed.

From enquiries made in regard to the success of the "Health Campaign," which was recently carried on throughout the Province, there is a consensus of public opinion from various organizations including the Boards of Trade, Service Clubs, newspapers, parent-teachers associations, etc., that the medical men did much to popularise the profession in this province by their action in taking the public into their confidence and teaching them more about the prevention of disease.

The profession was rather startled by a letter of a circular character dated May 9, 1922, which was sent out by the Workmen's Compensation Board. It solicited a definite signed statement to the effect that the medical men would render gratuitous service to recipients of mothers' pensions, should they apply for it. The reply was left to the Council of the Association to answer and after consideration a letter was sent to the members of the above Board drawing their attention to the fact that it had been the habit of medical men for unknown generations to assist the sick without hope of reward when they were in indigent circumstances, but stating that members of the profession could not put themselves on record as being willing to supplement the inadequate measure of relief afforded by this Department of the Government by proffering gratuitously the services of the profession. It was also recommended that this letter should be the sole reply from the profession.

Membership in the British Columbia Medical Association is steadily growing and it is felt by the executive that in the near future the profession in this province will be completely unified. Highly satisfactory results have been obtained by the executive secretary in his membership campaign. With the exception of a few outlying points every medical man has been personally visited; and an evident desire on the part of the profession to co-operate in the various proposed reforms was noted. The executive and the several committees have held many meetings during the past few months, and the following matters of importance are at present under consideration:—Government Venereal Clinics; Well Babies Clinics; Matters affecting the relationship of the medical profession and the Workmen's Compensation Board; Medical Contracts; Lodge and Fraternal Societies practice; Chiropractics and other illegal cults; also other questions of minor importance.

Several individual complaints or grievances have been ventilated and taken up by the Executive to the satisfaction of the parties concerned.

GENERAL

EVIDENCE BY DECLARATION

A few weeks ago, by reason of a misunderstanding between the Crown officers of Toronto and the authorities of the Toronto General Hospital, I was requested by the Attorney General to preside over an informal but representative Committee to consider the proper practice in cases of apparent crime.

Inter alia it was agreed that it would be of advantage that a simple and practical statement as to "Dying Declarations," "Ante Mortem Statements" or "Evidentiary Declarations" should be prepared for the guidance of medical men generally and those in hospitals particularly

I have prepared the following after conference with experienced Crown officers and medical men: I am, however, wholly responsible for the document.

William Renwick Riddell.

Osgoode Hall, Toronto, April 21, 1922.

Declarations as Evidence

The general rule of our law is that only what is said under the sanction of an oath (or of its legal equivalent) can be received as evidence. But for about two hundred years, the English law, which our law follows, has made an exception in what have been called "Dying Declarations," or "Ante Mortem Statements"—sometimes "Evidentiary Declarations."

General Remarks

When a judicial investigation is being made into the death of any person by homicide, statements made by that person respecting the circumstances resulting in his death, are admitted in evidence, if such statements are made by him when under the influence of a conviction that his death is impending.

Sometimes such evidence is of the very greatest importance, since frequently no third person was present. It is, of course, the duty of every good citizen to disclose crime and to preserve evidence of it. A medical man, therefore, attending a patient likely to die under circumstances indicating a crime by act of omission or commission which directly or indirectly caused his death, should endeavour to obtain such evidence from him as is available; and this sometimes is as useful to protect the innocent accused of crime as it (more frequently) is to convict the guilty.

This is not (as it is sometimes offensively put) to act the part of a detective, but to act the part of a good citizen and it is called for only in cases of apparent homicide where there is reason to suspect that the condition of the patient is due directly or indirectly to crime, foul play or criminal negligence.

Speaking generally, it is always wise for the doctor as soon as he thinks that a case is hopeless, to inform the patient of the fact—he may have affairs to settle, a will to make, directions to give, etc.

Difficulties may sometimes arise as to which it is impossible to lay down any fixed rule—for example the patient may be of such a temperament that a statement of this kind would probably cause death sooner than it otherwise would occur, etc. Medical men are always conscious that (speaking generally) their first duty is to the patient, and that consequently nothing which can be reasonably and properly avoided should be done which is likely to harm the patient; and yet, exceptional cases may occur in which the private must give way to the public good. The medical man must face the situation if and when it arises and determine as his conscience and sense of public duty dictates. Cases of this kind are exceptional; and in no case should fanciful or captious objections be raised; in all cases of real difficulty, the Crown Attorney should be at once consulted.

Rules of Law

To make a Declaration evidence, there must be in the mind of the patient an impression of impending death; if he believe that his case is hopeless, but that there will be a prolonged continuance of life, a Declaration is not admissible. There must be expectation, a hopeless expectation, of death near approaching. It is of no importance that the physician or any other than the patient, thinks he may or will recover; the important thing is the expectation of the patient. Nor is it of any importance how this expectation is induced, whether from the patient's own observation, statements of medical men or otherwise; the essential matter is its existence, however induced.

This expectation, impression and conviction that death is impending, may be manifested by the patient in any of several waysh; e may say so in so many words or he may indicate his conviction of impending death by changing countenance and appearing distressed or terrified when he is informed of it, etc. He may do this without any words of apprehension; and still make his conviction clear.

It is of great importance for the ends of justice that the attending physician should not only make the state of the patient unmistakably clear to him, but also that he should, if possible, obtain unmistakable evidence that the patient was convinced and without hope.

DIRECTIONS FOR TAKING DECLARATIONS

Where there is ample time, the Police and Crown authorities may be communicated with to take the Declaration; but no chances should be taken whereby the evidence may be lost.

The doctor should satisfy himself that the patient understand what is said to and by him.

The Declaration may be elicited by questions put to the patient.

Everything said by him in respect to the circumstances causing death should be noted, even if it may seem to be immaterial.

It is very desirable that the Declaration be reduced to writing; where circumstances permit, it should be read over to the patient; and if he is able, he should be got to sign it; witnesses present should also sign as witnesses. Magistrates sometimes examine a patient on oath and the examination is signed by both—this is permissible.

It is, however, not absolutely necessary that the Declaration be reduced to writing at all. If circumstances do not permit of a written Declaration, an oral Declaration should be obtained. In that case, all present should take full notes of what is said, so that the memory may be refreshed (if necessary) when evidence is to be given of the Declaration. (Such notes are, however, not evidence in themselves.)

If the Declaration be reduced to writing and circumstances prevent its being signed by the patient, the witnesses should sign it after making certain that it is accurate; the absence of the signature of witnesses is not fatal to the Declaration but such signature is always advisable.

Practical Rules

1.—A Declaration is admissible in evidence only concerning the circumstances resulting directly or indirectly in the death of the patient himself.

2.—It must be made under the influence of a conviction in the mind of the patient that his death is impending.

3.—It may be made to anyone.

4.—The doctor should not imperil the obtaining of such Declarations by waiting for the Police or Crown authorities.

5.—Where there is ample time it is well to communicate with Police and Crown authorities.

6.—A Declaration may be obtained by questions; and when the statements of the patient are not full, it is often well to supplement them by information obtained in answer to questions.

7.—Where possible the Declaration should be reduced to writing, read over to and signed by the patient—if it is also signed by witnesses, this is the ideal Declaration.

8.—But a written Declaration without signature is admissible.

9.—And so is an oral Declaration.

10.—In case of any difficulty at any stage, the Crown officers should be at once consulted.

11.—In all cases of doubt, the Declaration should be taken, leaving it to the Court to determine its admissibility and value.

12.—Crown and Police authorities generally prefer to take the Declaration by stenographers—these rules are, however, not intended for the guidance of such authorities—but for medical men or laymen who can seldom obtain stenographic assistance.

William Renwick Riddell.

Osgoode Hall, Toronto, April 20, 1922.

The Canadian Radiological Society has applied at the recent meeting of the Canadian Medical Association in Winnipeg to be recognized as a separate department of medicine in affiliation with the Dominion organization. Its active membership consists exclusively of reputable medical men, members of the Dominion Association who are actively engaged in this specialty, and derive the major portion of their income from it. They have recently established a Bureau of Consultation and are prepared to give advice to members of the profession on all matters pertaining to the use of x-ray and radium, and also to assist and advise institutions and physicians who desire to purchase apparatus in the selection of their equipment. The value of efficient roentgen ray examinations in diagnostic work is being increasingly recognized by all, and therapeutic action of both x-ray and radium is at present being carefully studied in every important medical centre.

At the annual session of the Medical Council of Canada held in Ottawa on May 30th and 31st it was decided to order an examination in English and French to be held at Montreal and Halifax on October 10, 1922.

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Obituary

DR. RUSSELL WITHERS

One of the oldest physicians in Nova Scotia died recently at Annapolis in the person of Dr. Russell Withers. He was born in St. John, N. B., Feb. 22nd, 1836, and was thus over 86 years of age. He graduated from Columbia University in 1865 and practised in Annapolis for 45 years.

During the recent war he, and Dr. A. Robinson of the same town, who graduated in 1857, worked as in the days of their youth to attend the sick in the absence of younger men who went overseas.

Book Reviews

Papers from the Mayo Foundation and the Medical School of the University of Minnesota. 1915—1920. W. B. Saunders and Co., Philadelphia and London, 1921.

For the occupied man who rarely can find time to explore the labyrinth of experimental medicine this volume will fill a long felt want. Paper after paper of the best type of investigation is here found well abstracted and in a form acceptable to all; the great mass of experimental protocol is omitted and in its place a well written summary of the results obtained, at times a brevity so marked is exhibited that one wonders at the perfection of expression that allows so much to be put before one in such tabloid form. As in the volume of the Mayo clinic practically all the systems are touched upon and many excellent resumes are to be found. Coming from a university medical school there are various research problems not strictly medical or surgical, but of them the same high praise can be given. If this is a sample of a particular publication we are compelled to admire and to hope that readers will be able to remember the striking feature of the brevity when they in turn take pen in hand. N.B.G.

Abdominal Pain by Professor H. Norbert Ortner, 2nd Medical Clinic, University of Vienna, authorized translation by William A. Brams, M.D., late Lieutenant Commander, Medical Corps, U.S.N., and Dr. Alfred P. Luger, first assistant, second medical clinic University of Vienna.

This work represents an attempt to touch upon every known form of abdominal pain. Well classified according to particular regions, the detailing of an enormous number of painful conditions is gone over in a comprehensive ramble. It is not a book for a student but rather something that any practitioner who knows the ground might well enjoy and read with profit. A few curious errors are in evidence "Nische" is the x-ray worker's nitch or notch in a picture, malena, our well known melaena. There are many sensible and practical clinical observations, many on the other hand do not appeal, such as considering tenderness of both vagi in the neck a sign of toxic neuritis in tuberculosis, and again importance being attached to such things as the presence of spirochaetes and spirilla in the faeces.

Published by Rebman and Co., New York. The book may also be obtained from the MacMillan Co., St. Martin's House, Toronto. N. B. G.

In their introduction the authors direct attention to the need for a comprehensive book dealing with diagnosis and treatment of tuberculosis in early life, presented from the standpoint of the pediatrician. Their work covers the ground fairly well and may be recommended. It shows, however, either haste or carelessness in its make up, misspelled words abounding throughout, while tuberculosis of the eye, trachea and bronchi appear with caseous pneumonia under tuberculosis of the upper respiratory tract. Open air schools receive scant mention, while the preventorium is not noticed. J. H. E.

Pulmonary Tuberculosis, Its Etiology and Treatment by David C. Muthu, M.D., Medical Superintendent Mendip Hills Sanatorium, Somerset, England, Demy 8vo, pages VIII. 381, 28 plates. London Bailliere Trudall and Cox, 1922, Price 12s 6d.

Muthu's work deals with diagnosis and treatment along generally accepted lines and his results in his Sanatorium may be accepted as practical proof of the soundness of his methods. Much of his book deals with the question of etiology and in his discussion he brings forward many hypotheses which are generally recognized as untenable and disproven. This portion of his work cannot at the present time be recommended to the general practitioner as safe and sane, he deals too much with theory. J. H. E.

Tuberculosis. The relation of Tuberculosis to general bodily conditions and to their diseases by T. Parkes Weber, M.A., M.D., F.R.C.P. London H. K. Lewis & Co., 1921, price 2b. 6s. 27 pages. Demy 8vo paper covers.

This pamphlet is the First Mitchell Lecture on Tuberculosis, delivered before the Royal College of Physicians, London, November 1, 1921. He reviews the present position of the tuberculosis problem, discusses immunity and reinfection, the influence of diabetes, syphilis, cirrhosis, Hodgkin's disease, gout and other diseases, and makes reference to tuberculides and spontaneous pneumothorax, with a splendid bibliography of the latter subject. J. H. E.

Lessons on Tuberculosis and Consumption by Charles E. Atkinson, M.D. of California. 12mo cloth, 470 pages. New York and London, Funk and

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and would appear to damn the whole work in the opinion of most right thinking physicians. "Only when it is altogether impossible to secure the advice of a physician skilled in dealing with tuberculosis and in whom you place trust and confidence and with whom you will cooperate, should you attempt to manage your own case. However, if this course is forced upon you, a careful reading of the appropriate lesson, followed by a little thoughtful reflection, will very likely enable you to accept or reject the diagnosis of tuberculosis with sufficient accuracy to form a basis for future action. Should you conclude that you have tuberculosis, then by carefully and conscientiously fitting the rules for recovery to your own needs you may look forward with much confidence toward ultimately winning the coveted prize. It is my earnest desire to make this book as helpful as possible, and criticism will be appreciated. I would like for the reader to feel perfectly free to express his opinion without restraint, and all suggestions for improving the lessons will be received with thanks."

J. H. E.

Twenty-First Annual Report of the Canadian Tuberculosis Association Published at the office of the Association, Bank Street, Ottawa, 1921.

This volume, which is for general distribution, contains the transactions of the 21st annual meeting held at Toronto, May 21, 1921. To this is added a concise summary of the reports of the Board of Consultants who visited the Sanatoriums of the Department of Soldiers' Civil Re-Establishment, and summary reports of all the Canadian sanatoriums and special hospitals, including preventoriums. It gives a comprehensive view of the forces lined up in Canada against tuberculosis and as issued from year to year, is a valuable volume for reference, which is a credit to the Association. It forms the last report of the able and energetic Secretary, Dr. G. D. Porter, who has for so many years been indentified with this work. The new President is Mr. A. B. Cook of Regina and Dr. R. E. Wodehouse, O.B.E., succeeds Dr. Porter J. H. E

International Clinics. Thirty-second series, volume I, 1922. Edited by H. R. M. Landis, M.D., Philadelphia, U. S. A., with Medical and Surgical Collaborators in United States, England and Canada. J. B. Lippincott Company, Montreal, Que. Price, $2.50 per volume or $10.00 for the series of four.

Following six excellent clinics on medical subjects, rheumatism, heart disease, anaemia, foreign proteins in the causation of disease, there are the usual departments of medicine, pediatrics and surgery. The last one hundred pages is devoted to a critical review of the more important contributions in medicine and surgery which appeared in the leading journals during 1921. These articles give the physician a bird's-eye view of the progress of the year.

J. H. E.

Basal Metabolism. Its Determination and Application. Frank B. Sanborn, M.S., Editor. 6x9 inches, 282 pages with 10 plates, 60 illustrations and 25 tables. Boston, Sanborn Company, 1922. Price $6.00.

This work is the product of 22 contributors. Nine forms of metabolism apparatus are described with methods of use. The clinical applications of studies in basal metabolism are discussed by various writers who have had special experience in the diseases assigned to them. All necessary tables are included, making the book a practical and invaluable guide to the laboratory worker as well as to the physician wishing to interpret the results obtained. There is a bibliography of selected references which summarize the development of basal metabolism. Through its various stages references are found as late as December, 1921. J. H. E.

Internal Secretion and the Ductless Glands by Swale Vincent, D.Sc., M.D., Professor of Physiology in the University of London. Second Edition, pages 422, 105 illustrations. London, Edward Arnold & Co., 1922. Price 25s. net.

We welcome this second edition of Prof. Vincent's work which received such a hearty welcome in 1912 and has been out of print since 1914. It is a most excellent summary of our knowledge up to the end of 1921, of the structure and function, both normal and pathologic of the glands of internal secretion. The clinical aspect of the subject received much more attention than in the former edition. The growth of our knowledge of internal secretions is traced in an able and interesting way, following pathological, clinical and experimental methods. He believes that the most valuable contributions in the near future will be derived from a careful study of clinical conditions and a patient investigation of pathological anatomical findings. J. H. E.

Mentally Deficient Children. Their treatment and Training. 5th edition, G. E. Shuttleworth, M.D., B.A., etc., and W. A. Potts, M.A., M.D. Pages XVIII and 320, illustrations 29 including 21 plates. Size er 8vo, price 10s 6d net.

This is an excellent manual regarding the care of the defective child. It is profusely illustrated and may be recommended as a good handbook.

There is a useful account of the development of the interest in these weak minded children, throughout the various countries of the world, showing that England is not backward in this present day uplift.

The appendices are more valuable to the English reader than the American, but the whole volume is one of the best published on this interesting subject. G. W. H.

Mind and Its Disorders. 4th edition. W. H. B. Stoddart, M.D., F.R.C.P., pages XVI and 524. Illustrations 84 including 10 plates. Size Demy 8vo. Price 22s 6d net.

This work on mental disorders is written in Stoddart's usual concise, and easily read manner and it is an excellent text book from the student's standpoint.

The influence of the Freud school is very clearly seen through the volume, and it does not improve the book as the general tendency today is towards the decadence of the Freudian views, while retaining the value of the Psycho analytic methods. For this reason, while the book may be recommended to the practitioner as worthy of his library, yet it is a little too decided along this line to be a general text book.

One may hope to see still further revision of the work follow with a gradual lessening of the Freudian influences. The general plan of the volume is however excellent, and there is no excessive amplification in any subject so that there is no unnecessary reading to be done. The description of the varied paretic and sensory manifestations of the depressed and maniacal cases alone makes the book well worth reading. G. W. H

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Medical Association Journal

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X-RAY AND CLINICAL FINDINGS IN NORMAL CHEST OF CHILDREN—6 TO 10 YEARS

National Tuberculosis Association Medical Research

THE National Tuberculosis Association of the United States some time ago decided to appropriate $20,000 to further research work in problems related to its own field in the United States. One of the researches undertaken was an effort to establish the X-ray and clinical findings in the chest of a normal child up to ten years of age. For this problem the National Tuberculosis Association nominated the following groups of roentgenologists and clinicians. Dr. H. K. Pancoast and Dr. H. R. M. Landis of the University of Pennsylvania, Dr. F. H. Baetjer and Dr. C. R. Austrian of the University of Johns Hopkins, and Dr. H. K. Dunham and Dr. K. D. Blackfan of the University of Cincinnati. The signed reports of these physicians is here presented in two sections.

The X-Ray and Clinical Findings in the Normal Chest of the Child. Report of the Clinical Division of the Committee on Medical Research of the National Tuberculosis Association.

The value of Roentgenography in determining the presence of pulmonary disease has long been recognized. Studies to determine the roentgenograms of various pathological lesions of the lung have been almost without number, yet much difference of opinion exists in the interpretation of findings, largely because no satisfactory observations have been made establishing the variations that may occur in the normal. To one observer, shadows noted are indicative of disease; to another, they are not evidence of a pathological process; to one, they present lesions of clinical significance; to another, they suggest changes of no moment.

In the spring of 1920, that Committee called together the collaborators in this work and instructed them to set about in ways of their own choosing to solve the problem, extended to them a financial grant and in order that the problem might be a very definite one, asked that the immediate study be limited to a consideration of the chests of normal children between the ages of 6 and 10 years. The work was begun promptly and their final report is herewith presented.

Theoretically, the normal child is one of ideal height, weight and development for his age, without subjective or objective evidences of deformity or of disease and without residual changes due to antecedent pathological processes. Practically, a normal child is one of average height, weight and development for his age, symptom-free and without signs of disease, but as a result of residual changes that persist. An appreciation of these facts makes it apparent that the findings, clinical and roentgenographic, in normal children as we meet them will vary greatly from any fixed standards and still must be considered as variants of normal.

The clinical data dealt with in this report were obtained by careful examination of apparently healthy children between the ages of 6 and 10 years. All children who showed signs of disease were excluded from the series. Individuals from various strata of society, foreign and native born, residents of urban and of rural communities, school children and children residing in institutions, children exposed to tuberculosis and some without a history of such exposure, children with and without a history of previous infectious diseases, all symptom-free, and of an approximately normal height and weight for their ages, were studied. A history of each individual was recorded and in making the examinations of the chest, care was always observed to have the child relaxed and to see that no cramped or unnatural posture was assumed, for, as is well known, faulty position may lead to findings that cause confusion in interpretation. In addition, a tuberculin test was made on every child. The clinical data were then assembled and after the roentgenologist had interpreted his plate independently, the clinical and roentgenographic findings were correlated.

In all, over 500 children were thus studied and as a result some definite conclusions seem warranted.

As in the adult, so in the child vocal fremitus is more marked over the right upper chest than over the left.

It is generally stated that the percussion note elicited over the lungs of normal children within the age limits under consideration, is fuller, more tympanitic, of higher pitch and more resilient than that noted over those of adults, and that frequently the tympanitic quality is quite outspoken, especially over the lower lobe of the left lung. Although in general our observations confirmed this view, we have been impressed by the fact that in an appreciable number of such children, the note obtained on percussion over the lungs is indistinguishable in quality from that elicited over the lungs of normal adults and that the usual resilience of the note is lacking. These findings in many instances have an analogue in shadows noted in the X-ray films, shadows indicative of increased density along the bronchial tree, similar to those seen in the plates of normal adults. This correlation of the findings on physical examination and on X-ray study is more constantly possible in studies of the upper half of the chest. When minor changes, similar to those discovered by X-ray examination of the upper lobes, occur in the bases, they usually escape detection on physical examination. In those instances, in which no shadow is found to explain the deviation of the note from the generally accepted one, it is our belief that the lack of resilient quality may be due to a decreased elasticity of the chest wall.

The so-called tympanitic quality of the percussion note over the left base may be increased, decreased or be entirely lacking, depending upon the degree of distention of the stomach or colon, the curvature of the spine, and may likewise vary with the position of the diaphragm or with the posture of the child during the examination. The note over the upper thorax is often the same on the two sides. Kronig's isthmus averages 5 to 6.5 cm. in width. The lower margins of the lungs posteriorly are at the level of the 10th or 11th rib and descend from 1.5 to 3.5 cm. during forced inspiration.

A just detectible diminution of resonance over the apical regions is of no significance unless associated with a modification of the breath sounds in those areas or with other abnormal ausculatory findings.

It is generally accepted that normally in childhood, the breath sounds have a harsh, sharp character, with expiration longer and better heard than in the normal adult. This so-called puerile breathing is physiological and though it may seem trite, let it be emphasized that this exaggerated vesiculo-bronchial respiratory murmur, especially well heard in the areas overlying the great bronchi (*i.e.* anteriorly at the level of the first interspace and the second rib just lateral from the sternal margins, and posteriorly, particularly on the right side, at the level of the 2nd to the 4th spine) is often incorrectly interpreted as evidence of pulmonary disease. An ausculatory finding that has not been pointed out, or at least, has not been emphasized, has come forcibly to our attention in carrying out this study. Just as the full, deep note or higher pitch characteristically elicited by percussion of the child's chest is often replaced in health by a note more like that produced when one percusses the normal chest of an adult, so, on auscultation of a child's normal lungs, the exaggerated or puerile breath sounds may be lacking, and instead the so-called vesicular respiratory murmur characteristically present in adult life is heard. This finding, regarded by us as a physiological variation, has been noted as early as the age of four years and may perhaps occur in younger children. It is more readily appreciated and more often found than the variation in the percussion note just described. In more than 50% of the children in which this type of breathing was heard, examination with the X-ray gave findings like those obtained by a study of normal adult chests. In fact, the agreement of clinician and roentgenologist was so constant that we have come on the basis of these variations to designate the chest of normal children as of "puerile" or of "adult" type. The essential fact to be stressed is that so-called vesicular respiration is heard with great frequency in normal children, and is to be regarded as a variation of normal and not necessarily as an indication of disease.

These variations and those of the percussion note are more generally found in children with a history of infections of the respiratory tract. No satisfactory explanation for this finding is offered. It may be due in part to altered resilience of the chest wall, a suggestion supported by the fact that in some instances in which it was noted, diminished elasticity of the thoracic wall was apparent on percussion. It may stand in relation to variations of elasticity of the parenchyma of the lung. It may be due to a relative narrowing of the lumen of the bronchial tree. It is hardly to be considered evidence of increased density of respiratory tissue, for, theoretically, at least, that should lead to a modification towards bronchial breathing.

Concerning the whispered voice sounds, little comment needs to be made other than to emph size their loud transmission often with syllabation over the region of the major bronchi. Ausculation of these sounds over the upper thoracic spine of the children has led to the conclusion that D'Espine's sign as indicative of enlarged tracheo-bronchial lymph nodes is, to say the least, of doubtful value. In 23 of the children, this sign was elicited without other signs of a mediastinal mass and without any corroborativ evidence on X-ray examination. In 3, the sign could not be elicited, although from the X-ray plate it might have been inferred that it should be. Eustace-Smith's sign is so generally present in normal children that it is of little or no practical diagnostic worth. The presence of these two signs together with impairment of resonance in the interscapular region is all too frequently made the premises for a diagnosis of tuberculosis of tracheo-bronchial lymph nodes. This is unwarranted for, as indicated, these signs are unreliable evidence of a pathological condition and the determination of a diminution of resonance in the interscapular region requires such a nicety of technic that even masters of percussion disagree as to the presence or absence of significant findings in this region of the chest.

A year ago, in the preliminary communication to this Society, we stressed the importance of the rôle that antecedent infections might play in the production of areas of increased density within the respiratory tract. (Bronchial tree, parenchyma of the lungs, etc. This fact is reemphasized, for further study has established the importance of it. Not only may recognized or remembered infections of the bronchi and lungs be responsible for alteration in these tissues, but other diseases not ordinarily considered of significance in this regard may be causal of such changes. For example, our observations indicate that after measles, pertussis or tonsillar infections, areas of increased density radiating from the hilum into the bases especially, occur with great frequency. Such lesions generally are not discovered on physical examination and would be unsuspected but for the use of the X-ray. They are referred to in the clinical part of our joint report in order to point out the need of a careful history as well as examination in all individuals, before proceeding finally to interpret the findings of the Roentgenologist. By way of digression, it may be interesting to point out the fact that though measles and pertussis have been known to produce lesions in the upper air passages, involvement of the lower tract has been considered a complication and was thought to occur only when evidence of bronchitis or of broncho-pneumonia were discovered. Our observations indicate that there may be a mild inflammatory process throughout the respiratory passages in a large percentage of the so-called uncomplicated cases of these diseases. This suggestion warrants further study in relation not only to the infections under consideration but also other infectious diseases. That such shadows, mediastinal and basal, noted in children who give a history of uncomplicated measles and pertussis are evidence of healed processes is evidenced by the experience that similar shadows of like origin have remained unchanged and without the development of clinical symptoms in a series of children observed from 3 to 5 years. Such changes must be properly evaluated as indices, not of present disease, but of lesions past and healed, not as warrant for the diagnosis of present illness and the institution of treatment, but as scars of infections met and overcome.

Most of the children included in this study were tested with tuberculin—some were given a cutaneous test with old tuberculin (Pirquet)—others were tested by the intracutaneous method. (Craig).

The foregoing facts have been detailed at some length to establish the major thesis that, clinically, the ideal, normal child is a hypothetical impossibility. Children, apparently healthy, symptom-free and active, show on careful examination many deviations from fixed standards, variations that must be interpreted as within physiological limits; standards of height and weight must be elastic; measures of resonance and of resilience of the chest must not be rigid and estimates of acoustic phenomena must permit of a range of difference from the ideal. These facts, clinical experience establishes beyond peradventure, and they suggest a corollary, namely, that X-ray examination of the chest of such children may be expected to show comparable deviations from a fixed ideal roentgenogram.

The studies reported, fortified by past experience, warrant the following conclusions:

(1)—The data obtained on percussion and auscultation of the lungs of normal children show wide variations from a fixed standard. These variations are usual and are considered to be within normal limits.

(2)—Inasmuch as the changes referred to are dependent often upon alterations that persist as the residua of past infections of the respiratory tract, it is obvious that a careful anamnesis, with special reference to all infections, is necessary if diagnostic errors are to be avoided. Even a history carefully taken is often unreliable, as minimal infections are soon forgotten by many and among the unintelligent classes even more significant indispositions are not readily recalled

(3)—Failure properly to evaluate these deviations from a fixed standard will often lead to the unwarranted diagnosis of disease and to even less justifiable treatment.

(4)—With a proper appreciation of the widest variations that the normal may present from the ideal, the informed clinician is better able correctly to understand the findings of the Roentgenologist, and each, cooperating with the other, is less liable to error.

(5)—D'Espine's sign as indicative of enlarged tracheo-bronchial lymph nodes is of little value.

(6)—Recognition of and familiarity with the foregoing data is of cardinal and practical importance to every patient, potential and established. Without a proper appreciation of the facts set forth, no intelligent differentiation between a normal and an abnormal respiratory tract can be made.

In brief, to establish the presence or absence of disease, it is imperative that all data—clinical, laboratory and roentgenographic—must be evaluated and correlated and that no one fraction of the evidence be stressed to the exclusion of the others.—(*Signed*)—*C. R. Austrian; H. R. M Landis; Kenneth D. Blackfan.*

The X-Ray and Clinical Findings in the Normal Chest of the Child Report of the X-Ray Division

It was soon realized by the X-ray members of the groups that an attempt to describe a normal chest was practically impossible. Their endeavours soon began to centre around the description of a theoretical normal with wide variations that would serve as a basis for the interpretation of abnormal appearances and tend to preclude the possibility of erroneous diagnoses being based upon faulty interpretations of hilum shadows, trunk shadows and linear markings more or less altered in appearance by the frequent respiratory infections of children. They realized that herein had existed the greatest source of error in interpretation, and no doubt the Association had this same thought in mind when the Committee was appointed to take up these investigations. Errors in interpretation have been made chiefly in connection with the diagnosis of pulmonary tuberculosis.

It was the consensus of opinion that children are probably more apt to show definite X-ray evidences in the hilum and trunk shadows of simple as well as serious respiratory infections than adults. Practically all children of the ages of those examined have had at one time or another one or more respiratory infections, especially measles and whooping cough, that are likely to produce very apparent changes in the shadows mentioned and which will remain distinctly visible for a variable period of time. These apparent deviations from the normal are not necessarily abnormal when observed, but may be the harmless results of one or more infections. No doubt such appearances have many times been misinterpreted as evidences of tuberculosis. In the conclusions reached by the Committee the attempt has been made to preclude this possibility.

Many of the general observations made have not been included in the conclusions. One of those perhaps worth mentioning is the fact that the heart of the child is found to extend relatively further to the right than in the adult.

The thoroughness with which the studies were carried out may be in part realized from the number of individuals examined. Over five hundred children were selected from all strata of life, as stated in the clinical report of the Committee.

The groups comprising the Committee met at the Phipps Institute, Philadelphia, March 3rd, 1922. Prior to this meeting there were misgivings as to the possibility of an agreement upon any very definite conclusions, but much to the satisfaction of all the members a definite agreement was reached and the conclusions were completed after a few hours careful deliberation.

To assist in a better understanding of the conclusions of the Committee, a composite diagrammatic reproduction of several roentgenograms was made and is shown in the accompanying illustration. It must be remembered that the three zones like the chest have thickness as well as length and breadth. Thus the zones extend anteriorly and posteriorly from the lung root as well as laterally.

Conclusions of the X-Ray Division of the Committee

The Normal Chest.—The normal chest of the child from the roentgenologic standpoint is subject to such wide variations within normal limits as to be beyond the possibility of exact description.

Hilum Shadow.—The conglomerate shadow commonly called the hilum shadow, when found lying entirely within the inner third or zone of the lung area can be disregarded, (or regarded as normal) except where it is made up of a solid mass of homogeneous shadow giving undoubted evidence that it represents a growth or mediastinal pleurisy.

Calcified Nodes.—Calcified nodes at the root of the lung, without evidence of lung disease, are of no significance except as a possible evidence of some healed inflammatory condition, possibly but not necessarily tuberculous. They are a common finding in normal chests.

Density and Thickness of Trunk Shadows—In the normal lung the bronchial trunk shadows are not visible in the extreme apical regions. For convenience of description the remainder of the lung is divided into three vertical zones, extending outward from the lateral border of the spinal shadow to the lateral chest border.

The inner zone contains the root shadows.

The mid zone contains the trunk shadows, gradually fading out into their final subdivisions.

The peripheral zone contains radiating lines from these and fading off before the periphery is reached.

Where in the mid zone or peripheral zone, these shadows do not disappear in the characteristic fashion described, the appearance may be evidence of a variety of conditions, past or present, of an inflammatory nature or otherwise. It may accompany a tuberculous process but is not necessarily indicative of tuberculosis.

Improper or Misleading Terms.—The use of the terms "peribronchial tuberculosis" and "parenchyma tuberculosis" is not to be recommended in the interpretation of roentgenograms of the chest. Until corroborated by laboratory or clinical findings, the use of the terms "active" and "quiescent" should not be definitely applied to evident lesions demonstrated on plates.—

X-Ray Treatment of Throat Infections.—Witherbee considers that the treatment of focal infection for the throat by X-rays, as compared with surgical removal of tonsils and adenoids, gives more thorough and complete results, besides being safer and applicable to cases in which there may be contra-indication to operation. With the patient lying face downward and the head turned to the side, the position and angle of the patient and tube corresponding to that for radiographing the lower molars, about eight treatments to both sides, at two-weekly intervals, are given, using a 7-inch spark gap, five milliamperes, four minutes time, 10-inch distance, and 3 mm. of aluminium as filter. By this method the shrinkage of the tonsil and lymph tissue of the lateral and posterior walls of the throat produces a drainage of the crypts of the entire mucous membrane, and in 80 per cent. of diphtheria carriers so treated bacilli were removed in from two to four days. From an experience of nearly 500 cases so treated, Witherbee is of opinion that the method is free from serious complications, burns and injury to adjacent glands being impossible under proper technique. The shrinkage following treatment revealed two cases of abscess of the tonsil completely encapsuled by fibrous tissue. The method is specially indicated in chronically infected throats in vocalists, and in these cases associated with rheumatism.—*Brit. Med. Jour.*, May 13th, 1922.

SOME HOSPITALIZATION PROBLEMS—HOSPITAL STANDARDIZATION*

MALCOLM T. MACEACHERN, M.D., C.M.

General Superintendent, Vancouver General Hospital

THE subject as announced is far too large to be covered in the space of time allotted to me on the programme and, therefore, I will deal with one problem only, the most important one ever before our hospitals, and that is: "Hospital Standardization."

Before commencing let me tell you I most sincerely appreciate this privilege of having an opportunity of addressing a Provincial Medical Association on matters of most concern pertaining to the alleviation of suffering and to the eradication of disease, a service to humanity and one of the highest order. I realize that the Association I am addressing is a highly organized body standing for the advancement of medical science and practice. I congratulate you on your organization, your business methods and your splendid spirit of service for the betterment of community life in every phase. Indeed I am delighted to have an opportunity of laying before a well organized and powerful body of medical men, this very important question of hospital standardization, and I feel sure I can count in every way on your sympathetic support and cooperation.

You are assembled here for disinterested reasons for the improvement of yourselves in the best interests of the patient, for the advancement of medical science, for the rendering of a greater service to suffering humanity, in the combating of disease, for the making better of life, happier and more comfortable for all. It seems very fitting, therefore, that I should speak to you today on hospital service, realizing as we all must, that the hospitals are the doctors' workshops, from which is turned out the patient, as the product, in terms of health.

We have arrived at a time of perfecting organization in all activities of life. The day of communalism and cooperation is here, when men and women desire to work together to produce better results by cooperative effort. In all cases the results obtained depend on the kind of service rendered. Indeed, we must frequently take stock of ourselves in terms of service. The keynote of get-together meetings or conventions such as this, is service and better service. Corporations hotels, railroads and other commercial organizations aim today at high-class service. I have just crossed the continent and had occasion to acquaint myself with the service on six different railroads and some five or six important hotels. I particularly noticed the efforts made to give their patrons service. Railroads today are catering to their patrons by supplying all their wants and comforts and as the traveller crosses the continent he sits in comfort and luxury enjoying almost all the privileges of life, so complete is the service now being given. If commercial and business organizations believe that in their success they must regard service as fundamental, how much more essential is it that hospitals must likewise so believe, dealing as they constantly do not with dollars and cents, but with human lives and life and death. Indeed, hospitals must regard service as the very ground on which they stake their right to exist.

The realization, therefore, of what real service is to sick humanity, is the fundamental doctrine of hospital standardization, as demonstrated today throughout this continent. It is the acid test and the crux of our claim to carry on in such important work as dealing with human lives. All must now realize that hospitals are indispensable factors in community life and must measure up to a service essential for the best interests of the patient.

In order to accomplish our task it is necessary to develop a better understanding between the medical profession and our hospitals and to foster a real cooperation and that sympathetic feeling conducive to a more constructive policy in our institutions known as hospitals, the aim being that the highest service possible may be brought to the patient. My task may not be easy, because I know there are many misunderstandings about hospitals which yet exist, both in the minds of the profession and of the public; but, to know each other better is to work together better and to accomplish more. It is a most significant fact that the Ontario Medical Association and the Ontario Hospital Association should be meeting jointly this morning; indeed it is a good forecast, one that sees the Medical Association taking a more active and constructive interest in the hospitals of this province. Your Association, Mr. President, has already evidenced high worth and good calibre through your active organization and your profound interest in all matters of medical science and public health. I trust this power, this interest, this constructive ability will be so turned towards the hospitals in their reorganization and development as to render increasing and better service. This is especially needed now when the world is growing so commercialized, commercialized even to the extent of an inhuman economy, which makes us apt to forget the human side with its suffering, its failures and its wastage.

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We hear today a great deal about conservation of such material things as forests, fisheries, furs, etc. We must hear more of conservation of health. One of Gladstone's most perpetuated utterances here applies: "In the health of the nation lies its strength." Health means national greatness, and surely the war records of "physical examination" of soldiers has banished all the conceit we had when it was found that fifty percent of our manhood was physically defective, and thirty-five percent of this was preventable. When we consider it in dollars and cents the annual national loss is appalling. I was greatly impressed by some statistics appearing in the 1917 report of the National Health Committee of the United States, and though these were compiled four years ago, I believe we are justified in considering that almost identical conditions exist today. This report states that about 3,300,000 people in Canada and the United States suffered from some form of illness during the year. Of these approximately 800,000 belonged to the industrial or producing class. These lost on the average about $700.00 per year, making a total of $560,000,000.00. Allowing for an equal amount of money to take care of them when ill, there would be a total loss of $1,120,000,000.00. One-half of this loss was found to be preventable, or $560,000,000.00. During the same period there were 1,650,000 deaths, of which forty percent were preventable, and estimating these at $6,000.00 each, the amount agreed upon by most statisticians, this would represent in monetary value an added loss of $3,960,000,000.00, thus making a total loss of $4,520,000,000.00. This does not take count of disabilities and expenses attached to care of dependents or of many other conditions. Why all this? Because we are not equipped and armed to fight and prevent the ravages of disease. What percentage of the medical profession take an active interest in the problems of public health and hospitals outside of their own circumscribed professional world? Very few indeed. We must organize a great national army of health: doctors, nurses and others, with good leadership, and hospitals and health institutions of all kinds from coast to coast of Canada, and these institutions must be so developed as to be worthy of the name hospital, because of the real service they give to each and every patient within their walls.

The practitioners of medicine in our hospitals must take stock of and put into working order the machinery required for better results. You say, we have advanced and have achieved,—that is quite true—but we have not overtaken our tasks, we are not yet obtaining the best possible results either in medical or hospital practice.

You, as a medical profession, have your problems, many of which do not concern me, but you, and I, as a hospital administrator, have much in common, and together, today we are discussing one of these. You, as a profession, must be interested in the question of public health in its broadest sense, a sense which includes all activities existing for keeping man healthy, prosperous and happy, a great economic problem to any nation. The hospital, with its equipment and personnel, holds an important strategic position on the battle front and is a tangible expression of the health of the community. The hospital must be an *effective* agency in the combating of disease. The war has proven to us that without such fully organized and equipped institutions we could not have carried on. Indeed, it is not reckless to say that the war was really won by the highly organized and developed medical, nursing and hospital services of the allies, for without soldiers physically fit, without disease prevention, without disease control and without the scientific and wonderful medical and surgical procedures, what would have happened our armies? The hospital, therefore, with its equipment, its personnel, holds a strategic position in the community and in the nation as a real factor in the fight against disease, besides having other and various functions, as for instance: the training of doctors, nurses and attendants to recruit the great army of health, the advancement of scientific and preventive medicine and scientific research and the spread of health education by precept and example. If your hospital and all it stands for is not the best institution in the community, then go back and make it so.

In the past hospitals have been regarded more or less as havens of convenience or as stopping places for the sick and to all intents and purposes as exercising the functions of a boarding house, with the addition of an antiseptic odor as carbolic, iodoform or ether. In fact, in many instances, the odors were the only indication of the nature of such institutions. It is unfortunate that some institutions like this still exist to-day, and it is only in the past year I have visited hospitals such as described which could not even be classified as good boarding or rooming houses; to-day these must be re-organized or put out of existence. The unsuspecting public expect you and me to assume the serious obligation of rectifying this in the best interests of humanity, and indeed they have confidence in our doing so.

The hospital has various duties to perform, and these extend to the patient, the doctor and the community. The hospital must provide a service to the patient in order that the doctor can apply his treatment most efficiently, for the mutual and fundamental objective is the return of the patient to health and happiness in the quickest and most comfortable manner, so that he or she may in the shortest time possible again become a producer adding to the national resources or assets of the country. Every sick person is a waste, a non-producer, a liability while being treated, and a loss to the state as a revenue producer. The hospital and the doctor, therefore, have a much interlocked obligation to fulfill, humane in its nature but yet one of patriotic and national character, a task pulsating with the ideal of service as a natural duty and an obligation we cannot and must not evade.

Hospitals are your workshops, your factories, and the product is health, the dividends are health and must pay one hundred percent returns. The hospital with the services and all connected therewith exists for the patient and the patient has the right to demand the highest quality of treatment and attention. The patient has the right to demand that every efficient means is provided for the arriving at a correct diagnosis, that every possible form of treatment, medical, surgical or special, be available, and that in every direction he receives everything necessary for his best interests.

The community expects all this and usually has such confidence in the hospital and its organization that they make no question. It is usually the public money which is spent, and it is given expecting a proper return. In some cases an imposing structure may inspire such confidence and pride in the community as to overshadow and obscure the poorest and most dangerous service. It is very easy to camouflage in our hospitals. The public must know what the hospital is doing for the money that is being spent, and what they should really expect. To this end hospital standardization will enlighten them and will, I believe, rectify conditions today existing and not in the best interests of the patient, the doctor, and the community.

In its application today hospital standardization establishes safe and competent treatment for the bringing back to health of the patient, if at all possible, in the quickest and most comfortable manner, and aims at the best obtainable results. It is a standard of service, sound, sensible and practical and it is within the reach of every institution to apply the same and to get results. When effectually carried out, hospital boards or trustees and officials can look their patients honestly in the face and say: "We have given you the best it is possible for us to give you;" and they can turn to the community which has liberally furnished them with money and answer: "We have discharged our duty efficiently and return you big dividends in health and lives for the money you have given us." Then and then only will the institution progress, and the patients and the public will have therein that confidence so necessary today.

The minimum standard as announced this continent over during the past few years and as carried to every hospital, to every hospital official, to every trustee or director and to the members of our medical profession, lays down a few definite clear-cut principles as a guidance to all hospitals desiring to measure up, to what they should, in the honest fulfillment of their obligations.

The first principle as laid down by this standard deals with the medical staff or the medical men attending the hospital and doing work therein. It asks that these men be organized into a definite staff or group for the specific purpose, particularly, of studying the work carried on within its walls, analyzing same, taking stock of it, finding out the successes and the failures, in short, carrying on a medical audit of the work done in the hospital. There is in all hospitals today a careful financial audit at regular periods and how much more important is it that there should be an efficient medical audit on the work done in the hospital. All this work should be analyzed by the staff, whether it is good, bad or otherwise, and this too should be done at regular intervals. Analysis will lead to better results in the future by the honest consideration of successes and failures of the past. It is only reasonable to expect that results are not always up to our personal desires, and I know of no better way by which one can assist the other than by discussing the same in a meeting such as the above. This discussion must be done frankly, openly and constructively. If the number of men attending the hospital is not too large they can all attend the conference. I have seen such a conference carried on successfully when it was attended by eighty-seven doctors, with intensive interest kept up throughout, but I believe that more than this number might be somewhat cumbersome, and possibly grouping according to the different branches of work would be better. In some hospitals where there is a large numbe· of attending men, the following grouping might be suggested: (a) Medical, including Neurology and Infectious diseases; (b) Surgical, including Gynaecology, Orthopedics, Genito-Urinary and Dermatology; (c) Obstetrics; (d) Eye, Ear, Nose and Throat; (e) Pediatrics. These groups can get together at least once a month to study, to review and to analyze the work of their respective departments. Certain conditions should be laid down at the commencement, Firstly,—that each man attend if at all possible. Secondly,—that each doctor is frank and honest in his statements. Thirdly,—that each doctor cast aside his prejudices and discuss all matters coming up with an open mind. Fourthly,—that constructive criticism be given and accepted by all taking part in the conference. In short, the ideal spirit of the whole meeting should be one of mutual assistance and cooperation—a study to benefit the doctor and to help the next patient under similar conditions. The cross-examination of each other should be keen and thorough and with the ultimate object in view of avoiding failures like those of the past and of transforming the present untoward results into future efficiencies. These meetings must not create antagonism but must result in even better *esprit de corps* amongst all medical men attending any hospital. It is very important that we meet and banish individual and group personal jealousies and antagonisms, especially in the smaller cities, towns and urban communities where this sometimes unfortunately exists. We must break all this down and keep in mind first and last the best interests of our patients.

The staff conference should review and investigate three main points; these are: (1) the casualties or deaths of the various services; (2) the infections occurring in the hospital; and (3) the unimproved patients. They may consider many other matters concerning the making more efficient of the hospital work, but the three points mentioned will be found to cover most of the ground. It may be desirable on some occasions to take a particular operation or disease and to make a six months or yearly summary on these cases with results; for instance: recently in a hospital which I know very well a very extensive report was compiled on all the goitre cases admitted during the year. This resumé showed conclusively that the death rate was too high and lead to the production of a very valuable report from the staff of the institution with certain well laid down rules and regulations to be followed by the different practitioners in the future. Therefore, as well as a review of the current or monthly work, it is also valuable to take up certain phases of the work spread over a longer period which will give more scope for comparative results. However, such a conference may find many matters to deal with, but primarily, they should take up the current work of the hospital in close review and ask themselves if they are obtaining the best possible results. A report of each conference with any recommendations deemed advisable should be handed in to the superintendent of the hospital after each meeting. The superintendent or one in authority will then take whatever action is deemed necessary or advisable. In such an arrangement not only does the patient profit but so does the doctor and the hospital very materially. The community, knowing that such is the case, will have more confidence in the work of the institution, for what they want is results.

Let me leave with you this thought in regard to the first requirement as laid down in the standard, and that is: that there be regular group study by the doctors attending each hospital, carried on in the form of a constructive medical review, by which all inefficient work, all incompetent or unnecessary surgery, will be checked up and prevented in the future, such a conference to be congenial and conducted in a mutual cooperative spirit, giving the maximum result to all concerned.

In further relation to the medical staff, hospital standardization requests the ethical practice of medicine, just the same ethics that every doctor in securing his degree declared himself willing to live up to: all tendency to commercialism in the profession must be eliminated. Special stress is laid on the pernicious practice of fee-splitting Many are not clear on what this means but my interpretation is that such a practice consists in any procedure in medicine, and particularly surgery, that savors of a commission for services not rendered or of the exploitation of the patient for commercial gain. Surely a profession such as ours is above anything like this. It is the natural right of every patient to know what they are paying for and to whom they are paying their money. Every doctor is entitled to be paid for services rendered if the patient can afford it, but doctors sending their patients to surgeons who will pay them the highest commission or bonus for turning over their work, had better quit medicine and go into the business of buying and selling live stock, where they can carry on such a business honestly and legitimately; the doctor who peddles human lives to the lowest bidder surely is not worthy of a place in the ranks of the noblest group of men in the world. If such a condition exists it is up to you to put a stop to it and let every doctor who dares to darken the doors of a hospital, a sacred institution, be ethical and straight, carrying on his profession with a moral conscience which at all times stands for honest dealing with the patient, both socially and from a scientific or technical standpoint. To eliminate any suspicion of the so-called fee-splitting habit, one principle should always be observed, and that is: that the patient know to whom and for what he or she is paying the money. If this is carried out it will eliminate all secret division of fees.

The next requirement as laid down by hospital standardization deals with medical case records. The time is far past when patients can be treated and cared for without careful records being made thereof. Every hospital on our continent has the right to demand a record of every case treated therein. I do not think that any hospital has the right to exist today without keeping proper medical records. Much has been said, much has been written and unfortunately, it is too true, that much has yet to be done in this respect. It will be wasting your time for me to tell you what a medical record is or should be; suffice, then, to say it should not be a fairy tale, a novel or an excuse, but on the other hand, should be a clear, concise statement of fact and data and should embody a complete history, setting forth complaints, personal and family matters bearing on the case, how the illness commenced and developed and giving a complete examination of the different systems, especially the one affected: a record should represent an endeavour to ascertain the present condition, and should be a diary of the chief points of treatment and convalescence. It may be necessary to add special reports, such as x-ray, laboratory, operating room, etc. In addition, of course, there must be the nurse's portion,—the graphic temperature, pulse and respiration chart, medication sheet and nurse's notes, the latter being a careful record of all observations from minute to minute and made constantly while the patient is in the hospital. Such a record gives the doctor an intelligent and accurate knowledge of his patient so that he can far more effectually apply his treatment.

The advantages and uses of such records are many but I can only mention a few:

First—They are the basis for medical review and audit in the hospital, as I have already described. They are the medium through which stock-taking of the work can be carried on. They form the basis of any analysis when ascertaining how the hospital is carrying out its obligations, and spending its moneys.

Second—Medical records are most valuable as regards the patient, should he return to the hospital or be treated elsewhere.

Third—Medical records are useful beyond measure for furnishing correct data for the advancement of medical science.

Fourth—Medical records are of untold value medico-legally, when a hospital accepts suit as defendant in a court case.

Lastly—and perhaps most important of all, medical records make doctors take better care of their patients, for they imply routine examinations and when all this is in print there is a tendency to exercise greater care and attention in looking after the patient. The doctor benefits personally by gaining more scientific and systematized knowledge. The taking of the medical record inspires greater confidence on the part of the patient in the doctor, and eventually results in drawing to the doctor a larger and better clientele I can instance many occasions which led to the doctor securing a greater number of patients by this habit of thorough and systematically recorded examinations.

We must all be convinced beyond doubt that records are necessary and of untold advantage to the patient and doctor and are certainly worth while. The difficulty, however, arises in the securing of the same and especially in hospitals where there are few or no internes, as in open and non-teaching institutions. Doctors *must* see that proper records are kept on their patients. If internes are available it is up to the doctor to see that their cases are properly written up and supervised by them. Where there are no internes or not enough to carry on the full work the doctor must write the record himself. Unfortunately, practitioners do not like writing histories, making the excuse that they have not the time to do so. My answer to that is: that the man who has not time to write a complete record of his patient has not time to practise medicine. Medical men wrote their records in the army but some do not want to do it in private practice. I believe that the medical courses in our universities have failed to impress on the student the importance of case recording. This should be inculcated into our young medicos before leaving the college. However, there is no excuse for any doctor refusing to submit a good record on his patient. Every medical man practising in any hospital, whether that institution is public, private, special, closed or open, should see that a good record is obtained on each of his cases. Some hospitals furnish competent medical stenographers to take dictation and this is a splendid help, It is only fair that the hospital should supply some assistance, such as a record clerk, competent to take dictation and do the filing, cross-indexing, etc.

Internes today write all the public ward cases but there are in addition a large number of private and semi-private cases which are not secured, owing to the difficulties of approach. Records should and must be obtained on these cases, expecially by the attending doctor or by his assistant. Three choices may be given him: first,—write the record himself; second,— dictate it to a stenographer; third,—leave an order for an interne to do it. In my experience it is extremely difficult to get the average practitioner interested in this work at all. In some hospitals the senior resident or the assistant superintendent can secure the approach to private and semi-private cases, but it may be difficult for the interne. Before leaving this point let me express my wish that every doctor will seriously realize his obligation to the hospital in seeing that a record on his case is produced, either by himself or some delegated authority; further, to realize his obligation to the interne by teaching him to write reports and supervising his work generally. Hospitals are rightly insisting on medical records and are now feeling that they do not want any doctors to send cases in who do not realize the very great importance of having a good record of them properly filed away in the institution for further use and reference.

Finally, hospital standardization aims at placing at the disposal of the attending doctor and the patient all the facilities necessary to assist in making a complete diagnosis. This includes various forms of diagnostic facilities, such as the laboratory with all its branches, necessary to carry on the routine work of the hospital in this line, particularly pathology, bacteriology and clinical microscopy. There is a certain amount of fundamental laboratory work to be done in every hospital, no matter whether it is large or small. The larger the hospital the more elaborate the laboratory system can be developed. Standardization, however, is moderate in its demands and does not expect the elaborate system which is found in most large institutions today. It, however, demands the essentials, and facilities to assist the doctor in making or confirming his diagnosis. It is quite obvious to you all that every hospital should have a clinical laboratory to do the routine work such as urinalysis, blood and spinal fluid examinations, smears and other procedures, simple but of very great importance to the doctor and the patient. The more complicated diagnostic methods such as serological tests and blood chemistry have of necessity to be left to the larger laboratories which are now everywhere found. There are also other laboratories for diagnostic purposes, one of the most important of which today is the X-Ray, a valuable adjunct in diagnosis and more widely used each year. The X-Rays are becoming extremely useful and so essential in treatment that no hospital can afford to be without this department. In the larger hospitals other lines of investigation are found necessary, such as the Metabolism, Cardiographic studies, etc., and special treatment departments are existent as,—Physiotherapy with all its branches, and of recent years Radium. However, even many large hospitals do not supply all these facilities within their own organization, though are able to make use of them elsewhere. This is proper, as long as the work is well done and entered in the records of the institution.

Granted that the hospital provides good accommodation and facilities for carrying on the work and an efficient staff, then there should be no excuse for bad work in the institution and the board of trustees can feel that they are playing fair with the patients and the community and that they are discharging their duties in the best interests of all concerned. When the conditions outlined above are complied with, the hospital is said to measure up to the minimum requirement as laid down by the standardization programme of the American College of Surgeons. This programme has been carefully constructed, has been tried and found successful, and today is offered to every hospital on our continent that wishes to accept it and live up to it.

This, therefore, is briefly, hospital standardization, which stands for a service to the unfortunate sick person. It is not a new thing, as a similar system was carried out during the war. It is well known to all that during the great war an efficient medical service was always provided, that medical case records could be produced for all patients, that there was a very careful scrutiny of the records and of the work through a careful medical audit. When one follows the course of the patient through the army medical organization we find in every instance an example of what we want in hospital standardization, that is:—everything that tended to the best interests of the patient carried out, so far as the applying of scientific skill the keeping of a careful record of all the work done, and the making of systematic reviews.

It is all very simple and does not imply much, if any, additional cost to the hospital—a small daily overhead will carry it. In our own hospital an elaborate record system costs approximately two cents per patient per day, but it is money well spent. At present we are giving a ten months course to graduate nurses that they shall become efficient in medical case recording, X-Ray and clinical laboratory technique. Such a person usually goes to a smaller hospital in our province or elsewhere, where she handles the three branches,—medical case records, laboratory and X-Ray technique. Usually she can take care of all three branches in a hospital up to one hundred beds. If fifty beds or less, she may be able to assume some of the nursing duties in the hospital. In fact, the standardization programme is so simple and practical that I see no reason why any hospital cannot adopt and carry it on. Though all this is clear, simple and generally admitted as sound in principle, yet there is some opposition or let me say apathy, on the part of our own profession; in fact it has been stated to me that it is an interference with their rights. It is to be regretted that such persons cannot realize it is in their own interests and will help immeasurably in their own practice generally. Some reputable doctors still treat it lightly, but these men must broaden their vision and get a new one on hospital service and practice. However, it is most gratifying to have the enthusiastic support of almost the entire profession of our country, in fact I believe that ninety-nine percent will enthusiastically endorse this programme. Further, we meet some apathy on the part of Boards of trustees who have not grasped the spirit of the movement. The public at large must know more about this programme and its scope so that they may fully appreciate it.

The success of the splendid movement amongst our hospitals of this continent can readily be realized by a glance at the figures obtained from the three surveys already made. During the past three years the American College of Surgeons have made three surveys of the 687 hospitals of one hundred beds and over in Canada and the United States. In 1918 there were 89 of these hospitals measuring up to the minimum standard requirement; in 1919, 198 had attained the requirement and last year, 1920, 407 met the standard. These results are most gratifying, and we are looking for greater returns in 1921. In Canada today every hospital of fifty beds and over is being reviewed.

Finally, ladies and gentlemen, let me urge you all to take a deep, intelligent and enthusiastic interest in this splendid constructive work now being done for our hospitals. Never before have these hospitals been presented with a better programme than that which is being carried to them and being so generally adopted, one which will be and is in the interests of all concerned. In this fair Province of Ontario I am hoping it will be received in an enthusiastic spirit at once by each of your hospitals, and for this year I am expecting great results.

THE EVOLUTION OF SURGERY AS I HAVE SEEN IT IN MY OWN PRACTICE

A. Groves, M.D.

Fergus

When Doctor Macdonald sent me an invitation to present a paper on the evolution of surgery as I have seen it in my own practice I felt very diffident about accepting it, lest the tenor of my remarks might take on the color and consistence of being merely personal, when in truth my intention is only to show the vast strides surgery has taken during the professional lifetime of one individual. A paper such as this can only touch a few of the advances. At the date of my graduation, 1871, Lister in Edinburgh was struggling to impress upon the surgical world the great truths of asepsis and antisepsis. His work is truly the dividing line between ancient and modern surgery and without it there could have been no evolution for asepsis is the root of modern surgery, without which evolution would have been impossible. There was at one time considerable discussion as to the merits of asepsis and antisepsis when really the only thing aimed at was asepsis, and antisepsis was one of the means by which it was achieved. Up to that time, and for years afterward pus formation was looked upon as the usual and almost inevitable accompaniment of a wound it was expected by the surgeon and he was rarely disappointed It did not occur to the surgeon's mind that pus arose from any error of technique but rather that it was something to be desired for he spoke of healthy pus and laudable or praiseworthy pus. If there was soreness or redness in a wound the formation of pus was encouraged by the application of that unscientific and unhygienic thing—a poultice. This kept out light and air and supplied heat and moisture, the four requisites for germ growth. It was in other words an almost perfect culture medium. When the pus poured out the fact was accepted as undeniable proof of the correctness of the treatment. The first step in getting away from the poultice was the wet dressing which was probably less injurious but healing could not go on normally in the abnormal condition o a sodden wound, so that in a short time the conclusion forced itself upon me that rest, air, sunlight and dryness were four great requisites in treating uninfected wounds to which, for infected wounds, should be added the removal of dead matter, and drainage. The practice of using dry dressings I began almost at the beginning of my work because it did not seem rational to expect normal repair under abnormal conditions and when I observed that wounds which were kept dry healed better than those with wet dressings I discarded the latter. At that time, and even since, it was claimed that antiseptic lotions destroyed the germs present but the fact was overlooked that the only germs destroyed were those on the surface where they did no harm and would die if moisture was not supp'ied, and that the germs doing all the damage were those within the tissue beyond the reach of any lotion. Even the method of irrigating infected wounds by means of multiple tubes with or without antiseptics is in the last analysis nothing more than thorough drainage, the fluid keeping the spaces open and carrying away decomposing tissue. Normal saline is probably the best solution to use but it should be discontinued as soon as the wound is clean in order to allow normal repair to go on. In those days the abdomen was surgically as well as anatomically almost a closed cavity. A few of the more daring spirits took out ovarian tumors but beyond that nothing was attempted. Even in the case of ovarian cysts it was the practise to wait until the growth was large and the patient's life was in danger before an operation was advised. Appendectomy, hysterectomy, prostatectomy, gall-bladder operations, splenectomies, anastomoses and all the many intra-abdominal operations of today were totally unheard of. I recollect the lecturer on anatomy in 1869 telling us, in describing the appendix vermiformis that it was an organ that was unimportant "because, it had no uses and no diseases." At that time a patient with acute appendicitis was said to have "Idiopathic peritonitis" and chronic cases were diagnosed as biliousness or indigestion; it is too often done yet, ignoring the fact that these are not diseases but results of disease. Even then there were those who dreamt dreams and saw visions; of such was Dr. James Bovell, Lecturer on Physiology in Toronto School of Medicine, who in one of his lectures told us that in his opinion the day was near at hand when the abdominal cavity would be opened as a matter of routine for diagnostic purposes. Looking back today I recognize him as one of the prophets, and that saying of his never faded from before my eyes although at the moment its fulfillment seemed impossible.

My early operative work was done under rather primitive conditions. The operating room was generally the kitchen, there being no other room large enough, and either a couple of boards were laid on trestles, or the kitchen table was used as an operating table. Milk dishes were used for basins, for wiping, sea-sponges were used, horse hair was taken directly from the horse's tail, generally the doctor's horse, If the operation had to be done at night a coal oil lamp supplied the light. Chloroform was the one anesthetic. It was dropped from the bottle with a split cork, the inhaler being a towel. For general use the method has not been improved upon. Ether may be safer but I have never seen a death under chloroform, and I gave it exclusively for more than thirty years. Sterile gauze and absorbent, sterile ligatures and all the refinements of modern practise were unknown. The trained nurse, the most valuable ally of the surgeon, had not yet arrived. My first major operation done July 5th, 1873, was the removal of an ovarian tumor and in those days the success of the operation was supposed to depend largely on the length of the incision and the treatment of the pedicle. Some operators advocated short incisions and some long, not realizing the truth that the incision should be fitted to the case, not the case to the incision. Some tied the pedicle and dropped it back into the abdomen, leaving the end of the ligature out, others fixed it in the abdominal wall either by stitching it to the parietes or by a clamp lying across the wound. The profession searching eagerly for truth had its attention fixed on non-essentials when the great light of asepsis opened their eyes and made all things possible.

Not having seen the abdomen opened I was anxious about many things and while strenuously thinking the matter over I remembered that typhoid fever germs could be present in running water, the drinking of which would produce the disease. That being so I decided to boil the water used in connection with the operation lest there should be germs of some kind in it, and I also boiled the instruments and everything coming in contact with the wound. The case recovered without pus formation and I continued the practice of boiling everything in all my work. In putting the abdominal wound together I used needles in a way similar to the old hare lip operation, the needles being passed through the whole thickness of the abdominal wall and wound around with thread. After the patient began going about, a large post-operative hernia developed and a similar result having followed my second case I considered exhaustively why it was. I concluded at last that it arose from defective technique. If the skin healed perfectly when its edges were brought together I could see no reason why the underlying tissues would not do the same thing if they were brought together anatomically each to each. As I set forth in a paper published in 1904 it appeared to me that muscles were for active work and fascia for passive resistance and that my post-operative hernias were a result of fascial incompetence owing to my failure to bring the edges of the cut fascia together. At my next next abdominal operation, in 1874, I stitched each layer together separately and was no more troubled with post-operative hernia. Needles and other methods of through and through suturing were discarded. So far as I know this was the first case where the principle of anatomical apposition of wounds was recognized and applied. At this time the treatment of congenital and acquired hernias consisted mainly in the application of trusses, the injection of irritants into the canal in inguinal hernias whereby it was hoped to set up adhesive inflammation and so close the canal and lastly the invagination of scrotal tissues to act as a plug but the treatment was usually a failure. The recognition of the fact that hernia is always the result of fascial insufficiency opened the way to its rational treatment. The solution of the problem of the radical cure of a hernia consists simply in putting all the tissues in the position they occupy in a normal individual, the important structures being the peritoneum and fascia. Once this principle was recognized hernia became a curable condition. An analogous state of affairs existed regarding perineal lacerations. In the early days the torn parts were denuded of mucous membrane and scar tissue and the raw surfaces stitched together producing an appearance of cure and nothing more. The condition was really worse than before operation for mucous membrane which was normally required had been dissected off and thrown away. It was evident to me that to restore the perineum it must be done anatomically, that is fascia must be joined to fascia, muscle to muscle, skin to skin, mucous membrane to mucous membrane. There was no redundant tissue to throw away. The basic idea in this as in all restorations or repairs being to bring the parts back to their normal arrangement and condition. The first time I did what I called anatomical perineal repair was in 1875, and the patient was confined two years afterwards, without the occurrence of rupture. In the repair of hare lip where there always is a deficiency of tissue the method laid down in the books even yet is to pare the edges of the cleft and so sacrifice tissue where there is already too little. The method I have used for more than thirty years is to make two flaps at the angles of the cleft, turning them down and then to make an incision on each side of the cleft at the junction of the skin and mucous membrane. These incisions are carried two-thirds of the way through the lip. The flaps are stitched together and then stitches are passed through two-thirds of the thickness of the lip, and tied; instead of stitches, hare-lip pins may be used, and my results appear to be better with them, finally the two angular flaps are stitched together. The perpendicular flaps make the lip of normal thickness and the angular flaps do away entirely with the disfiguring notch. I never sacrifice tissue in repair work if it can possibly be avoided.

The advances that have taken place in my time in operating for stone in the bladder are worth noting in a rapid review such as this. The cutting operation selected was almost always by the perineum and although the supra-pubic method was mentioned it was not approved of. My first case of stone in the bladder was in a man of 63, weighing over two hundred pounds, and a hard drinker. Surgeons of the highest standing had refused to operate thinking only of the perineal route. When he came under my care I decided on a supra-pubic lithotomy which I did April 20th, 1878, removing six calculi, and the patient promptly recovered. This operation was done in the bedroom in an old hotel with two students as assistants. There was no hospital nearer than Toronto and medical men were averse to countenancing unorthodox surgery. Within a short time I operated on three others in the same way (one being a boy of seven) and with similar results, and I became convinced that if the subra-pubic route was to be preferred in the most difficult cases it ought also to be best in simple ones. These four cases were referred to most approvingly in the American Encyclopedia of Surgery published in 1881. So far as I am aware these were the first supra-pubic operations done in Canada; the operation had been done about 1720 by Franco and by John Douglas and subsequently by various operators, but it was as yet practically almost unknown. The fact once established, that the bladder could be safely opened supra-pubically, meant that vesical tumors and diseases could be intelligently dealt with and was the basis of all modern vesical surgery. In connection with stone it might be of interest to compare the stone crushing operation of fifty years ago with the litholepaxy of today. Up to 1878 lithotrity consisted in repeated crushings, each of a few minutes duration, followed by severe reaction supposed to be caused by the operation, but in reality the result of broken fragments left in the bladder after an incomplete operation. Bigelow's evacuator by means of which the bladder is emptied at one operation changed the whole outlook of lithotrity. With single stones of small or medium size I have found it the operation of choice. I have not had a failure or a fatality and when we consider that there is practically no suffering and no long and painful convalescence I believe it, rather than lithotomy, should be done in suitable cases.

My first appendix operation was done in 1883, and fortunately was upon a very simple case for I was without experience of much value. Before this time I had begun to devote a good deal of attention to cleaning the skin at the site of operation, using soap and water with thorough brushing. To get my hands clean I used six brushes that had been boiled and washed my hands never less than half an hour with water that had been boiled. I had learned and applied the great principle underlying the command "to wash and be clean," and I have never had better results than when I followed that simple formula.

When iodine and other antiseptics came into use for skin disinfection I used them but did not give up my faith in washing.

In cases of encysted appendiceal abscess, where it is possible to open them without opening the general peritoneal cavity, I do so, but I don't take out the appendix, as by so doing the peritoneal cavity would probably be opened, adding greatly to the danger. I believe I have never lost a case of this kind. In these cases I always advise that the appendix should be taken out after complete healing has taken place. It does not appear to be good surgery to leave in the abdomen an appendix or any other organ known to be seriously diseased when its removal is not dangerous. I have known many cases of recurrent abscess, and when abscess does not recur there is the usual train of symptoms common to chronic appendicitis with all its dangers. The teaching that secondary abscess rarely occurs appears to me most erroneous. I have operated on more than fifty cases of recurrence, one being a child who had three recurrences before it was two years old. The idea that the appendix in such cases is destroyed or obliterated by inflammation is without foundation. I have never operated on such a case without finding the appendix and if I had failed to find it I would attribute the failure to my inability to do so, not to its absence. Every diseased appendix should be operated on at the earliest possible moment. An interval operation is fairly safe if one could be sure that there would be an interval, but he who does nothing hoping for an interval will lose many cases. The more acute the case the greater the need of immediate operation. In my opinion the so-called treatment by starvation and by enemata is far worse than useless, it is keeping up a pretence of treatment when nothing is being done in the very face of death. An appendicitis can neither be killed by starvation nor drowned by an enema syringe. Where an abscess has burst into the abdominal cavity I remove the appendix and wash out the pus by means of an irrigating tube using normal saline solution at a temperature about 110 degrees. To try to wipe out pus with a sponge is as hopeless as it would be to try to get the pus off one's hands by wiping with an infected cloth, besides wiping abrades the delicate peritoneal surface causing adhesions. Knowingly to leave pus or any other free foreign substance in the abdomen appears to be indefensible, especially when it is easily gotten out, and when the patient's condition will improve during the process. It has been said that irrigation will scatter the pus but to scatter it it must be moveable, and if moveable, move it out. To scatter it and leave it would be wrong. But why leave it?

Where an abdomen contains pus, if the condition has not lasted more than twelve hours there ought, judging by my own experience, to be recovery if thorough irrigation is done with warm normal saline. I seldom use more than five gallons, but my rule is not a certain quantity but a quantity sufficient to clean out the abdomen. When I began this treatment I occasionally lost cases because I failed in thoroughness but since I learned to do the washing properly I have had a series of ninety six cases of pus in the abdomen operated on within twelve hours from the time of rupture without a death. I do not follow the practice of putting in multiple drainage or placing the patient in Fowler's position because I leave no septic fluid in the cavity. The Fowler position is simply a method of attempting to drain septic fluid from one part of the abdominal cavity to another. If fluid will change its position of itself—then it should be washed out. The use of Fowler's position and the leaving in of multiple drains would be proof that I knew I had left removable septic fluid in the abdomen. Multiple drainage is properly used in a septic wound which can not be cleaned, but the abdominal cavity is not a wound and can be cleaned. Drainage of the general peritoneal cavity is impossible as can be easily demonstrated. Every drain inserted becomes walled off by adhesions in a very short time, and is a sinus that does not communicate with the general cavity. My observations have convinced me that a large proportion of so-called bilious attacks and indigestion are but the results of appendiceal disease. An acute attack of appendicitis occurs only in a previously diseased appendix and the condition should be diagnosed and the appendix removed before the acute attack occurs. This, not interval operations should be the ideal aimed at, and when it is realized by the profession and taught to the public that bilious attacks, indigestion, cramps in the abdomen, etc., are not diseases but only the results of disease, usually of the appendix, and that immediate operation is the only treatment then acute appendicitis and ruptured appendices will not be heard of any more. In almost every direction evolution has been going on rapidly. I shall refer only to methods of reducing hip joint dislocations.

In spite of the great advance made when the Bigelow method of scientific manipulation was substituted for the more or less blind force of the compound pulleys the practitioner usually feels considerable anxiety when called upon to reduce a dislocation of the hip. The manipulations vary for every form of dislocation, the movements to effect reduction must be in proper sequence and their direction must be changed at the proper moment otherwise failure will result. And even when everything appears to have been done properly the bone fails to go back into its place and the whole process is repeated with variations, the soft parts being more or less lacerated with each attempt. Indeed it has been recommended to tear the obturator internus in two in order to facilitate reduction. Having known men of ability fail after persistent effort it struck me that a method might be devised which would be simple in execution and positive in result. In looking at the os innominatum and the upper part of the femur in their normal position, the appearance is that of a somewhat flattened cone or pyramid, the head of the femur being the apex. When dislocation occurs, the head of the bone, that is the apex of the pyramid, slips down to the base and the problem of reduction is simply to replace it. It will be observed that in whatever direction the bone is displaced there is an open tunnel extending from the acetabulum to the head of the bone, and this tunnel through the soft parts, is kept open and straight, by the head and neck of the femur. To replace the femoral head is then an engineering problem and an engineer would solve it by following the line of least resistance, that is he would bring the head back through the tunnel it made in escaping. To do this I devised the following method.

The patient is placed on the mattress on the floor lying on the uninjured side. An anesthetic is given until complete muscular relaxation is obtained; an assistant stands behind the patient in a stooping position, having a roller towel over his shoulder and under the patient's thigh close to the perineum. He places both hands on the crest of the ilium to steady the pelvis. The surgeon grasps the patient's knee with one hand and his ankle with the other, flexing the thigh at right angles to the body and the leg at right angles to the thigh. The assistant now presses firmly down on the pelvis with his hands and at the same time makes slow steady traction by means of the towel, the pull on the head of the femur being in the direction of a straight line produced upward through the two acetabula. The surgeon holding the knee uses the femur as a lever having the towel for a fulcrum and he controls accurately the movements of the head as it is drawn back to its place. It does not matter in what direction dislocation has taken place, the principles are the same, that is—traction upward in a direct line to bring back the head of the bone through the tunnel it made. By this method the surgeon does no additional injury to the soft parts, he tears no muscles, he never hooks the sciatic nerve around the neck of the bone, he never accidentally changes one dislocation into another—he always succeeds in reducing a recent dislocation. The method combine —simplicity, safety and certainty.

TYPHOID FEVER IN INFANCY AND CHILDHOOD*

H. S. Whiting, M.D.

Senior Interne in Medicine, Children's Memorial Hospital,

Montreal

THIS paper is based upon an analysis of fifty cases of typhoid fever occurring in the wards of the Children's Memorial Hospital, Montreal, from the years 1911 to 1922 inclusive The cases were clinically unmistakably typhoid fever or were proven to be such by positive blood culture or positive Widal re-action.

It is only within the last sixty years that clinicians have agreed that typhoid fever occurs in the child. A great many figures are now available which prove that it not only occurs but that it is by no means rare. (1) Dr. A. D. Blackader of Montreal has reported 100 and (2) Montmollin 295 cases of typhoid fever in patients under fifteen years of age. A great many authorities still regard typhoid fever as rare under five years and very rare under two years of age. In Montmollin's 295 cases there were 15 under two years, and in 406 cases of all ages reported by (3) Schoon, 68 cases were under five years of age. In Blackader's series 4 were under two years and 13 between two and five years of age. The figures given above, largely based upon hospital practice, give some idea of the frequency of typhoid fever in children but we feel that it is probably much more common than these figures would lead us to believe. In forming an opinion in regard to the incidence of this disease in children one must bear in mind that only the severe cases are sent to hospitals and that parents, will not, as a rule, send a child to the hospital nearly as readily as an adult, and fortunately ill children are more easily cared for at home than are adults.

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*An analysis of fifty cases occurring in the wards of the Children's Memorial Hospital, Montreal, Canada.

The occurrence of typhoid fever in more than one member of the same family at the same time is well recognized. Our last six cases developed during a very interesting local epidemic, in one section of the city and was somewhat unusual in the way it struck down whole families at the same time, pointing to a food borne infection. The children seemed to be especially affected. In our cases four were from one family with three adults ill at home. The other two were brother and sister and their younger sister was ill at home. Several other similar cases were reported to us.

The occurrence of more than one case in the same family is not at all uncommon. In our series we had four children from one family, three from another, five from a third, and seven where one or both parents were in one of our general hospitals with typhoid fever

The failure to recognize typhoid fever, in some cases, in children is probably due to the indefinite and uncharacteristic onset of this disease, the short and comparatively mild course which is seen especially in younger patients, the frequency of acute and severe intestinal upsets and diarrhoeas in childhood, and the general lack of the application of laboratory methods to patients outside well organized and equipped hospitals. The introduction of laboratory methods in the study of typhoid fever, especially blood cultures, the Widal re-action and the bacteriological examination of the exereta has placed the diagnosis on a firm basis and has shown a larger incidence of this disease in children than was previously recognized.

It is convenient to consider typhoid fever in young persons under the following headings: The foetal type, infantile type, the type seen in early childhood and that in late childhood.

Foetal Type—(4) Morse of Boston has shown that typhoid fever occurs in the foetus. The disease is a septicaemia without involvement of the intestines, probably due to the fact that this organ is inactive. The foetus is infected from the maternal blood through the placenta. The result of this invasion by typhoid bacilli is foetal death and abortion, or a child born suffering from typhoid fever with subsequent death. A recovery has apparently not been reported.

Infantile Type—This includes all cases under two years of age. (5) Holt in his text-book, edition 1904, said he had never seen a clinical case of typhoid fever in a child under two years of age, not had he ever seen a post mortem on such a case. In the latest edition of his text-book, (6) however, he reported 11 cases under two years of age. Cases proven at autopsies are reported by (7) Ogle at four and one half months, and by Murchison at six months. In the 295 cases reported by Montmollin, 15 of them fall within this group. The majority of cases reported in this group have occurred during epidemics. It is interesting to note how relatively few children were affected in the Montclair epidemic in 1894. Of the 115 cases only 3 were under two years of age. In our series of cases two belonged to this group. The most striking features are the height and irregularity of the fever. Diarrhoea, tympanites and vomiting are more commonly seen than in later childhood. When associated with diarrhoea cases of typhoid fever in infancy are frequently considered to be cases of severe enteritis. One of our cases illustrates this point very well. One of the nursing staff was taken ill with typhoid fever and a search for the source of infection began. It was found that in the case of a female infant 9 months of age, admitted for and treated as a case of simple diarrhoea, the mother was in the Montreal General Hospital with typhoid fever. The child was then convalescent. A Widal was done and was positive. There were no rose spots and the spleen was never palpated. Had the nurse escaped infection this case probably would have passed unrecognized. Our other case was a boy one and one half years of age who, with his brother two and one half years old, were taken ill at the same time, entered the hospital on the same day, ran the same general course and went home together. Each had a period of continuous fever, with an average of 101° to 102° up to the 21st day. They both had abdominal distention and diarrhoea. There were no rose spots but the spleen was palpable They both were drowsy and irritable during the febrile stage. Each had a positive Widal.

Early Childhood—This group includes cases from two to five years of age. There are still many who regard typhoid fever as rare during this period of life. Blackader's figures show 13 in this group of his 100 cases under fifteen years of age

In our series 17 of the 50 cases were under six years of age. As a rule this group shows the mildest cases. There is a minimum of intestinal symptoms and a predominance of nervous manifestations, varying from apathy and irritability to acute delirium. Our cases showed the features described with the exception of a shorter course of fever than is generally seen. Almost all had temperatures for over 3 weeks. Severe cases may have an onset resembling meningitis.

Later Childhood—This group includes cases from five to twelve years of age. With increasing age there is a gradual transition to the adult type which is seen as a rule after the age of twelve years.

The general picture of typhoid fever in infancy and childhood resembles at its onset very much the adult type. General malaise, anorexia and vomiting, and a gradually rising fever are almost invariably present. About 50% of our cases showed an initial diarrhoea, the other half constipation. About half had headache but not the severe form seen in the adult. Abdominal pain is not common and is, as a rule, not localized. Delirium at the onset is seen only in the most severe cases. One of our cases had a chill at the onset. Only three had epistaxis. The period of rising temperature is said to be shorter in the child than in the adult but our cases did not show this with the exception of those of the severest type. The day of disease on admission to the hospital in our series of cases ranged from four to fourteen days.

Symptoms and Clinical course—There is usually a period of well sustained, continuous fever with an average of 102° to 104° depending upon the severity of the infection. This continues, as a rule, until the end of the 2nd or 3rd week when the temperature becomes irregularly remittent and intermittent and has a general downward tendency. A striking feature of the temperature chart in children is the irregularity and multitude of variations it shows. This may be very striking and one cannot predict from one day to the next what the temperature may be. Sometimes the chart shows the septic "Church Steeple" character for 2 or 3 days, followed by a few days of slight rise in the temperature, then a remittent type of fever may occur. One of our cases, a boy, thirteen years of age, who showed the typical clinical picture of typhoid fever, ran a continuous temperature for nine days and on the tenth day had a crisis after which the temperature remained normal. This is reported as occurring in children but even here it is rare. This case had the shortest period of fever of any of our cases. The average period was twenty-four days. Our case which showed the longest period of temperature was one of reinfection, in all 55 days. This was a boy 11 years old, who had over three weeks' continuous fever averaging 101°, was very ill, irrational and had incontinence. There were numerous crops of rose spots. From the twenty-first to the thirty-first day of his illness the temperature was irregular, averaging 102°. From the thirty-first to the thirty-eighth day there was a low continuous fever, average 99°, thirty-eighth to fifty-fifth day irregularity remittent from normal to 103°.

During the reinfection the patient was again very ill and irrational but there were no new rose spots and the spleen did not become palpable again. Reinfection occurs in about 8% of cases and as a rule during the fourth week. We had three cases. A typical one was a male nine years of age, admitted to the hospital on the fourteenth day of illness, dull and apathetic. Rose spots were present and the spleen was palpable. Up to the thirtieth day of illness he ran an irregular temperature from normal to 102°. For three days the temperature remained normal. During the next two days there was a step like rise. This was followed by a continuous fever for five days and for the following four days the temperature was irregular and became normal on the forty sixth day of illness. The rise in temperature after it has fallen to normal does not always mean a reinfection as it usually does in the adult. One of our cases showed this very well. This was a girl ten years of age who had a severe infection. A blood culture was positive on the ninth day of illness. On the twenty-seventh and twenty-eighth day the temperature was just above normal. The patient was apparently past the acute stage and seemed to be convalescent. On the twenty-ninth the temperature rose to 100°, on the thirtieth to 101°, and on the thirty-first to 102°. Her general condition at this time did not suggest a re-infection and a blood culture was sterile. On the following day her temperature was 98°. These slight rises during convalescence are common and are without demonstrable cause as a rule. The lymphatic system is rarely involved. One of our cases, a boy of two years of age with a severe infection, during the last three days of life, developed a swelling below the angle of the right jaw. At post mortem this was found to be due to an adenitis resulting from infection with the streptococcus.

The circulatory system shows very few abnormalities. The pulse rate in children is faster in relation to the fever than in the adult. The comparative steadiness of the pulse despite wide variations in temperature is a striking feature. This was well shown in a girl of ten whose temperature was very irregular and ranged from the tenth to the twenty-eighth day between normal and 102°. Her pulse however, in spite of the irregular temperature, remained about 120 and from the thirtieth to the forty-fifth day the temperature varied from 98° to 100°, yet the pulse remained about 100.

In our cases the foul mouth and coated tongue were as marked as in the adult. Abdominal distention in children is frequently absent and when present is, as a rule, not very marked. Very few children complain of abdominal pain or tenderness. The spleen is enlarged in all cases, generally sufficiently so as to be palpable. The majority of our cases had palpable spleens. The liver is not as a rule enlarged but it was in two of our cases. Knowing how easily a child's gastro-intestinal system is upset one might expect more diarrhoea in children than in adults. In cases of delirium there is usually incontinence. Constipation is the rule later in the disease.

Rose spots are thought to be somewhat less common in the child than in the adult. 50% of our cases showed these typically, as a rule over the abdomen and lower thorax.

Epistaxis may occur as an initial symptom; before admission to hospital it is said to be fairly frequent. Only two of our cases gave a history of it, but 10 cases had it during their stay in the hospital.

Bronchitis is a common condition in severe cases. Only four of our cases had it. Bronchopneumonia occurs not uncommonly as a terminal event. One of our fatal cases showed this. This was a boy two years of age, with a severe infection. Two days before death he showed signs of bronchopneumonia, which was confirmed at autopsy.

Involvement of the genito-urinary system is not common. Toxic albuminuria is frequently seen. Pyelitis and pyelonephritis are occasionally seen in severe cases. We had one case of this in our series: a girl, ten years old, with a severe infection. On admission the urinalysis showed only a febrile albuminuria. On the twenty-first day of disease examination showed albumin, considerable pus, a few red blood cells but no casts. Frequent examinations during the next two weeks showed much the same findings with casts on several occasions. The urine suddenly cleared up and remained so. Recovery of the bacilli from the urine can frequently be done. In some cases persistence of the bacilli during convalescence has been noted. One of our cases, a girl of eleven years with a typical typhoid fever of moderate severity, showed this. On the tenth day of convalescence a routine examination of the urine showed typhoid bacilli in great numbers. Urotropin in five grain doses three times a day was given and after five days the urine was found to be free from bacilli and an examination made one month after the patient was discharged from the hospital showed no typhoid fever bacilli in her urine. Urotropine seems to be almost a specific in these cases, and as in adults, acts within a week if it acts at all.

The nervous system in children may also show signs of the poison. Associated with the high fever in the early stages are drowsiness and apathy and nocturnal delirium is very frequent. All our severe cases showed this. In young children, especially those from two to five years of age, the severe cases frequently have an onset resembling very closely acute meningitis. One of our cases, a boy two years old, had an acute onset with vomiting, diarrhoea and high fever. On the third day he had several convulsions and was admitted to the hospital on the fourth day. He was very toxic, showed marked bowing of the back and retraction and stiffness of the neck. There were no eye signs and the Kernig sign was negative. There was slight abdominal distention. These findings, combined with the fact that the boy's sister was in the hospital with typhoid fever lead us to make a tentative diagnosis of this disease rather than meningitis. The nervous symptoms gradually cleared up, and within two days were entirely absent. The patient then ran a severe course terminating in death on the eighteenth day of his illness.

Routine Laboratory Finding — These show no difference from typhoid fever in the adult. The blood culture is positive during the first week and the Widal reaction is generally positive by the tenth day. There is a leucopenia as a rule but cases of slight leucocytosis occur. In our series leucocytosis was only found when complications developed. The urinalysis shows a febrile albuminuria in the severe cases.

Complications—The outstanding feature is their comparative infrequency and mildness. There are no complications peculiar to this disease in children The common and severe complications seen in the adult viz: intestinal haemorrhage and perforation are rare in the child. We did not have a case of either. There were no serious complications in our series except for one of our fatal cases who developed a septic adenitis and broncho-pneumonia. Otitis Media is said to be commoner in the child than in the adult. We had two cases. Superficial abscesses occasionally occur. We had three cases. Bacteriological examination showed the infection to be due to the staphylococcus. One case of severe furunculosis which was very resistent to treatment, showed this same organism. We have had two cases of typhoid osteomyelitis who were treated for typhoid in another hospital.

Diagnosis—Typhoid fever in children is probably much more common than is generally supposed. For this reason all cases of fever in children, where the temperature remains elevated for more than a few days without a definite cause, should be looked upon as a possible case and a blood culture taken. There are but few cases from which blood cannot be readily obtained for bacteriological and serological examination. In babies the longitudinal sinus can easily be tapped, in older children the external jugular vein, a vein on the ankle which is frequently comparatively large and the median basilic at the elbow are possible sources. The median basilic can generally be seen when a bandage is applied to the arm or palpated when not visible.

Treatment—The treatment used in our hospital is the same as is used in adults. In the acute stages a high caloric diet is used changing to soft and then full diet as soon as possible. The efficiency of this treatment was seen in our last group of cases in which all held their weight and a few gained slightly in weight. Hydrotherapy in the form of sponging is used with good results.

Results—These are good. The mortality given in text books is 5% as compared to 7% in adults. We lost two cases which gives us a mortality of 4%.

Post-mortem findings—These do not vary from those in adults except in young children there may be no lesions in the intestines. In one of our fatal cases an autopsy was performed and no lesions of the intestine were found. In such cases the typhoid bacillus must be found in order to make an exact diagnosis. In our case this was done, the bacillus being grown from the heart's blood, spleen gall bladder and intestines.

Summary

Looking at this subject as a whole one draws the following conclusions:

(1)—Typhoid fever in children is not as serious a disease as it is in the adult. This applies not alone to the actual mortality but to the whole clinical course including the complications.

(2)—Typhoid fever is a septicaemia with localization in the intestines except in very young patients where there may be no intestinal lesions.

(3)—Involvement of other systems is similar to that met with in adults.

(4)—The principal symptoms do not vary from those seen in the adult.

(5)—The fever is more irregular. The pulse is faster in proportion to the fever than in the adult and shows a tendency to steadiness despite wide variations in temperature.

(6)—The disease in the young may show a predominance of nervous manifestations.

(7)—Complications are uncommon.

(8)—No difference in treatment is indicated and the results are good.

I wish to thank all those who assisted me in the preparation of this paper. First, Dr. H. B. Cushing and Dr. L. J. Rhea for advice and counsel; second, the Superintendent of the Hospital, Dr. Norman T. Williamson, and his resident staff and finally the nurses who took so much pains in charting the cases.

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THE EFFECTS OF ULTRA VIOLET RAYS ON THE CALCIUM AND INORGANIC PHOSPHATE CONTENT OF THE BLOOD SERUM OF RACHITIC INFANTS*

FREDERICK F. TISDALL M.D. (TOR.)

Toronto

SOME eight or nine months ago, an extensive investigation was planned to study the effect of ultra violet rays on the inorganic constituents of the blood of rachitic infants. However, during the past winter and spring only a small number of patients were available for this study. This is probably due in a large degree to the excellent prophylactic measures instituted by the Hospital for Sick Children in cooperation with the Health Department of this city. Although the present report is limited to only six cases, the results obtained are very striking.

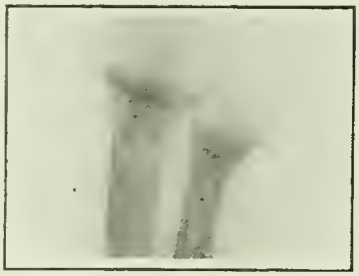

FIG. I.—Roentgenogram of the distal ends of the right radius and ulna of R. P., March 9th, 1922, before treatment with the mercury vapour quartz lamp. This shows the irregular ends of the bones with marked flaring and cupping. (Typical evidences of rickets).

Numerous authors have reported the cure of rickets by exposure to ultra-violet rays from a mercury vapour quartz lamp. (1-6). None of these investigators, however, reported any observations on the effect of ultra violet rays on the calcium and phosphate content of the blood serum. The effect of sunlight (which contains ultra-violet rays) on the inorganic phosphate content of blood has been noted by Hess and Gutman (7). These authors, concluded as follows: "It is evident that sunlight not only brings about a clinical cure of the characteristic lesions but also brings about an increase in the inorganic phosphate of the blood similar to that noted when the cure is accomplished by means of the specific cod liver oil."

This work is open to the criticism that no mention was made of the diets of the infants during the period of treatment. The investigation was conducted during June, July, August, September and October and in some cases it required from four to seven weeks treatment before an increase occurred in the blood phosphate. It is quite conceivable if the infants had been fed on summer milk, that an increased vitamine A content of the diet accounted for the changes produced, for it has been found by Drummond, Coward and Watson (8) that wide variations in the vitamine A content of butter are largely due to differences in the diet of the cow. Although I am convinced that exposure to direct sunlight will increase the blood phosphate, it is not clear that Hess and Gutman sufficiently controlled the conditions of their experiment to justify the conclusions which they made.

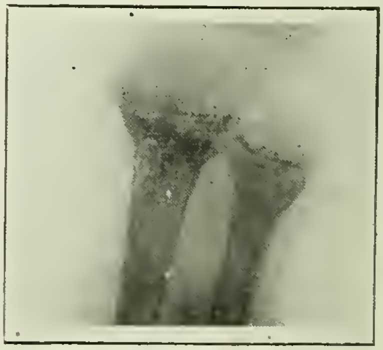

FIG. II.—Roentgenogram of the distal ends of the right radius and ulna of R. P., March 23rd, 1922, after a total exposure of 3 hours to the rays of the mercury vapour quartz lamp. Note the increased density of the bones also the deposition of new bone shown by the dark, irregular, horizontal lines at the extreme ends of the radius and ulna.

The results of the present investigation are

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*From the wards and Nutritional Research laboratories of the Hospital for Sick Children and the Department of Pediatrics, University of Toronto, Toronto, Canada.

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TABLE I

The concentration of Calcium and Phosphorus in the serum of infants with rickets before and after treatment with the mercury vapour quartz lamp and an ordinary 500 watt incandescent lamp.

Name	Age Mos.	Date	Ca. per 100 c.c.	Inorganic P. per 100 c.c.	Treatment	Previous Diet	Diet at time of treatment
			mg.	mg.			
R. P.	14	2-21-22	9.1	2.8		Soft diet	3% milk 30 ounces Water 10 " Dext. malt 1 " 3-22-22 soft diet.
		3- 8-22	8.1	3.1	14 hours exposure to rays of ordinary 500 watt lamp.		
		3-23-22	9.8	5.5	3 hours exposure to rays of M.V.Q. lamp.		
		4- 6-22	10.0	6.7	Total of 7 hours exposure, M.V.Q. lamp.		
G. A.	5½	2-21-22	9.2	3.4		Breast milk plus whole milk dilutions.	2% milk 25 ounces Water 10 " Lactose ½ "
		3- 8-22	7.7	2.8	14 hours exposure to rays of ordinary 500 watt lamp		
		3-23-22	10.7	4.8	3 hours exposure to rays of M.V.Q. lamp.		
			mg.	mg.			
I. H.	10	3-27-22	8.8	2.8		Breast milk	Whole milk 15 ounces Water 15 " Lactose 1 "
		4- 6-22	9.1	3.9	3 hours exposure to rays of M.V.Q. lamp.		
		4-12-22	9.7	4.4	Total of 4 hours exposure M.V.Q. lamp.		
C. C.	6	3-15-22	9.1	2.8		Butter Flour Mixture	Butter Flour mixture unchanged
		3-23-22	9.7	4.3	1½ hours exposure to rays of M.V.Q. lamp.		
E. T.	8	11-30-21	9.1	3.1		Breast fed	Breast fed plus protein milk.
		12-16-21	10.0	6.0	1¾ hours exposure to rays of M.V.Q. lamp.		
N. A.	6½	4- 1-22	8.8	3.2		Whole milk dilution	Whole milk dilution unchanged.
		4-18-22	16.1	6.1	3 hours exposure to rays of M.V.Q. lamp.		
Average values found in normal infants.............			10.0	5.4			

given in Table I. The methods used for the determination of the calcium and inorganic phosphorus have been described elsewhere (9-10). In all cases the whole body was uncovered and exposed to the rays of the mercury vapour quartz lamp. The distance of the lamp from the body was 60 cm. and the duration of the exposure generally 15 minutes. The anterior and posterior surfaces of the body were alternately exposed. In some of the patients daily treatment was given while in others it was given on alternate days. It is seen that a very marked increase occurred in both the serum calcium and phosphorus after a short exposure to the rays of the lamp. Clinical evidences of healing in all the patients followed this increase. In some cases roentgenograms were taken of the epiphyses and the increase in the calcium and phosphorus in the serum was also followed by definite evidences of deposition of bone salts. (Signs of healing, see figures I and II).

Two patients, R. P. and G. A., had been previously exposed to the rays of an ordinary 500 watt nitrogen filled incandescent lamp. A daily exposure of one hour's duration was given in each case for a period of two weeks. The results (Table I) show an actual reduction in the calcium content of the serum in both patients while the phosphate content was reduced in one infant and only very slightly increased in the other. The clinical evidences of the disease became more marked during the period of treatment. These patients were then exposed to rays from the mercury vapour quartz lamp which soon caused a definite improvement in their condition.

The question arises whether the improvement obtained in the rachitic infants was produced by any change in the food. The diets of two infants, C. C. and N. A., were not altered in any way. The two patients, R. P. and G. A., had been exposed to the rays from an ordinary incandescent lamp with no improvement, immediately before the treatment was begun with the mercury vapour quartz lamp. In G. A., no change was made in the diet while in R. P., it was changed to soft diet which was the food on which the patient first developed rickets. Changes were made in the diets of I. H. and E. T., but the different foods could hardly account for the very rapid improvement which occurred in the course of the following two weeks.

Care must be taken in the use of the mercury vapour lamp. With small infants it is advisable to start with an exposure of 5 minutes duration, with the lamp 100 cm. from the body. The length of exposure can then be gradually increased and the lamp moved nearer the body, until a maximum exposure is given of 15 minutes duration with the lamp at a distance of 60 cm. from the body.

CONCLUSIONS

1.—Exposure of rachitic infants to ultra violet rays from a mercury vapour quartz lamp, for very short periods, caused a marked increase in both the calcium and inorganic phosphate content of the blood serum.

2.—The increase in the calcium and inorganic phosphate content of the serum was followed by clinical and roentgenographic evidences of healing.

3.—No increase in the serum calcium and inorganic phosphate was obtained by prolonged exposure to the rays from an ordinary 500 watt incandescent lamp.

The author wishes to acknowledge his thanks to Dr. Alan Brown, Physician-in-chief, for permission to report these cases.

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While the present paper was in press, two articles have been published in which the authors have shown that the exposure of rachitic infants to ultra-violet rays resulted in an increase in the inorganic phosphate in the serum. The authors of the second paper also reported an increase of the calcium content of the serum. (1) Hess,. A. F. and Unger, L. J. (*Jour. A.M.A.* 78—1596, May 27, 1922). (2) Kramer, B. Casparis, H. and Howland, J. (*Am. Jour. Dis. Children,* 24-20, July, 1922).

The Doctor as Carrier of Poliomyelitis.—*Wallgren* (*Upsala Lakareforenings Forhandlingar,* March 15th, 1922) reviews recent advances in the epidemiology of acute anterior poliomyelitis which suggest that, as only one member of a family contracts the disease in most instances, the degree of susceptibility varies enormously in different persons. Another modern view is that propagation of the disease is largely dependent on carriers, and in this connexion the author refers to a personal experience. In the summer and autumn of 1919 he was working in a fever hospital in which there were some poliomyelitis. On September 3rd he left this hospital and took up duties in a chest hospital where there was a child, aged 18 months, suffering from tuberculosis of the skin and lungs. The temperature had fallen practically to normal when, on September 20th, it suddenly rose to 39° C. Acute flaccid paralysis of the lower limbs was found; lumbar puncture showed increased pressure, and there was a slight increase in the number of cells. The further course of the case was also characteristic of acute anterior poliomyelitis, and by a process of elimination the author comes to the conclusion that he was the carrier responsible for this case, and he is inclined to suspect that this sinister rôle is not infrequently played by doctors.—*Brit. Med. Jour.,* April 29th, 1922.

SOME OBSERVATIONS ON THE STARVATION TREATMENT OF EPILEPSY

Alton Goldbloom, M. D.

Assistant Physician, Children's Memorial Hospital, Montreal

OUR hopes with regard to the cure of epilepsy are constantly being raised with each announcement of a new remedy or a new method of treatment. Removal of the ovaries has had its vogue, trephining of the skull, its day, and now we hear of "encouraging results" following the removal of parts of the suprarenal glands. In all these methods our faith in the promise of a permanent cure has been newly revived with each new announcement. No doubt this latest fad, that of partial removal of the suprarenals will shortly take its place with its other predecessors among the discarded failures of medical treatment. It is a singular fact that all new drugs and remedial measures for incurable diseases are brought forward accompanied by such an array of bright promises and by so much apparent confidence in them by their promulgators, that the credulous physician and the gullible public, totally oblivious to the failure of hosts of other fads, hail the newest one as the one cure, at last, for which the world has so long been waiting. Turtle serum and injections of iodoform were each in their day the long sought for cure for tuberculosis; Coley's serum is still being tried in each new case of bone sarcoma. It is not so long ago that glowing accounts came to us from a convention held in Washington, of a cure for diabetes and I remember that at the conclusion of one of the papers then read the statement was made that soon diebetic coma would be a thing of the past and diabetes no longer a thing to be dreaded. Without being unmindful of the advance in our understanding of diabetes and of the distinct progress made in its treatment since the advent of this new therapy, the fact remains that people are still dying in diabetic coma and that diabetes is still all too well known to us.

So it has been with epilepsy—it is the remedies that have disappeared, but the dread disease is still with us. A year or two ago we allowed ourselves to be startled by the news of an asserted real cure for epilepsy. A drugless healer in the middle west had been curing epileptics, it was said, by subjecting them to long periods of starvation. This simple treatment was at once tried and as is usual with any new treatment, the results at first were distinctly encouraging. We have had several opportunities of trying out this treatment in the wards of the Children's Memorial Hospital with results not so encouraging as we were at first led to believe. I believe that our observations coincide with those of others who have tried this treatment.

To cite an illustrative case: Gwendolyn B. 10 years old, of healthy parents began to have fainting spells at about three years of age. These spells came at long intervals at first. Gradually their frequency increased until they occurred at first daily, then hourly and finally at about ten minute intervals. These spells were petit mal lasting about ten or fifteen seconds, the patient falling to the floor with each attack. Bromides in large doses and luminal over a prolonged period had no effect whatever upon the attacks. At the time of admission to the hospital she was having between 60 and 100 per day.

Physical examination was essentially negative. There was certainly nothing pointing to a definite nervous system lesion. Mentally she was distinctly precocious.

Upon admission to the hospital she was put to bed and given water freely, but no food except a little clear broth for ten days. On the eleventh day one ounce of orange juice was the only addition made to the diet. The food allowance was so gradually increased that it was only at the end of the third week in the hospital that she was getting anything like a sustaining diet. The bowels were kept open by means of enemas and salines.

During her stay in the hospital she made satisfactory and encouraging progress. While she had sixty attacks during the first twenty-four hours in the hospital, she had only six attacks during the second twenty-four hours and only one attack each day on each of the three days following. After the fifth day the attacks ceased entirely.

The child was happy in the hospital, rarely complained of hunger after the third day and was quite satisfied that she was getting some food whenever a cup of broth was allowed her. She was discharged to her home after three weeks, perfectly free from attacks and a sufficient, though not a liberal diet, low in proteins, was prescribed for her. Instructions were given to the parents to keep her in bed for another ten days, to keep the diet low and the bowels open with salines. These instructions were carefully carried out by the parents who were greatly encouraged by the results of the treatment. She remained well as long as she remained in bed. Two weeks after her discharge from the hospital the seizures gradually began to return, at first one or so a day, and when last I heard from her about one month ago, she was having two attacks per hour.

It would seem from this case that the starvation treatment is effective only while it is continued and while the patient remains in bed, but that it has no enduring qualities. The explanation of the improvement is first that the patient is kept in bed and secondly that the fermentative and putrefactive intestinal processes, so often the exciting causes of convulsions even in a non epileptic child, are reduced for the time being to a minimum.

So far as children are concerned, one often sees children who have been considered epileptics in whom the epilepsy is found to be purely of intestinal origin and who are therefore permanently cured by the application of strict dietetic measures. There can be no doubt also that such children, if they were regarded as epileptics would be permanently cured by the starvation treatment. Again, there is the neuropathic child whose convulsions are merely an hysterical manifestation on whom starvation would certainly have the effect of suggestion. We have recently discharged from the hospital a child who had been diagnosed as epileptic by several consultants and who, had he been subjected to the starvation treatment, would have been a powerful argument in favor of this new treatment. mother it was learned that he had a convulsion only when he was crossed, that it was possible to keep him free from attacks by giving in to his every whim, and by having him constantly carried about in his mother's arms. I felt that these convulsions were a neuropathic manifestation. The physical examination revealed nothing of importance. He was accordingly admitted to the hospital where for the first time his attacks were observed. It was then learned that whenever crossed he would first have a breath-holding spell, when he would become deeply cyanotic and then he would fall into a generalized convulsion which would last two or three minutes. After each convulsion he would fall into a deep sleep in which he would remain for an hour or more. I gave orders that he be placed in a cubicle by himself and left entirely to himself. He soon learned that no one was paying any attention to him and the convulsions promptly ceased. This child has been entirely well since his discharge from the hospital two months ago.

At the present writing there is in the hospital an epileptic child on whom starvation was tried for about nine days with very unsatisfactory results. The starvation had to be stopped because the child was fast going into a status epilepticus. He was eventually controlled by three grains of luminal and sixty grains of bromides daily. I believe that the explanation of the failure lies in the fact that there was no intestinal factor in his epilepsy and that therefore no source of irritation was removed by the starvation.

One is forced to the conclusion that the water treatment is only of temporary benefit in cases of epilepsy in whom intestinal putrefaction or fermentation may act as an excitant, and that we still must rely on one or other of the sedatives such as bromides or luminal or both for a greater degree of relief. The water treatment may be useful in those epileptics who have series of attacks at certain long intervals, when the patient may be starved every two or three months for a period of ten or twelve days. When dealing with children we must first eliminate every other possible cause of convulsions before branding the child as an epileptic, for

POST OPERATIVE COMPLICATIONS OF THE RESPIRATORY TRACT*

H. Ryerson Decker, M.D., F.A.C.S.

Pittsburgh, Pa.

COMPLICATIONS of the respiratory tract develop after operation with greater frequency and more serious consequences than most surgeons and anesthetists appreciate. No clinics and no clinicians are immune especially if they make careful observations and keep accurate records. Collected figures that are reliable, such as given in Table I. show that on the average one case in every forty-five operated upon develops a respiratory tract lesion, and that one case in every two hundred dies from the complication. This incidence alone should negative the impression which many surgeons have, that respiratory tract complications, if they do occur, are inconsequential and give rise to no mortality.

Table I.

	Operations	Morbidity	Morbidity %	Mortality	Mortality %	Mortality % of Morbidity
Cutler and Morton (1), Mass. Gen'l	3,490	65	1.8	33	.94	50.7
Armstrong (2), Montreal Gen'l	2,500	55	2.2	32	1.28	58.1
Mayo Clinic (3)	16,317	220	1.32	15	.11	9.6
Von Lichtenberg (4)	23,673	440	1.9			
Cutler and Hunt (5) Peter Brigham	1,562	55	3.52	11	0 7	20
Decker, Pittsburgh, 1920	5,976	69	1.2	29	0.5	42
Decker, Pittsburgh, 1921	2,125	16	0.7	6	0.3	37.5

Last year I (1) reviewed a series of 5,976 cases operated upon consecutively in the surgical services at St. Francis Hospital and my own at Presbyterian Hospital, Pittsburgh, in which series the morbidity was 1.2%, and mortality 0.5%, both comparatively low figures. (See Table I). One, however, should make due allowance for statistics. In our series we excluded minor cases which had no anesthetic or remained in the hospital less than two days, cases of primary surgical respiratory tract disease e.g. suppurative pleurisy, in which respiratory tract complications are to be expected, cystoscopic examinations, and finally nose and throat cases e.g. tonsillectomies where the patients remain in the hospital for so short a time, that records of the post-operative course are not available. Nor in our report did we take cognizance of the milder respiratory tract complications such as coryza, pharyngitis, and tonsillitis—inasmuch as they involved no serious consequence to the patient and furthermore were incompletely recorded. As a result of this study we were at least certain that respiratory tract complications do not occur more frequently in Western Pennsylvania than elsewhere. In this connection we feel quite sure that anthracosis is not a factor in their incidence inasmuch as a large number of our patients are mine and mill workers who have anthracotic lungs. It is probable that anthracosis has no disease significance as Klotz (7) and Haythorne (8) have pointed out from their laboratory research, other than that by interfering with free lymphatic drainage resolution of pneumonia is delayed, and that by stimulating fibrosis it is an aid to the localization and encapsulation of tuberculosis.

In the last sixteen months from January 1, 1920 to May 1, 1921, we have extended our observations, and now report 2,125 cases from the same sources as in our previous study (the surgical services of Dr. R. T. Miller, Mercy Hospital, Drs. R. R. Huggins, B. Z. Cashman, W. O. Sherman, and E. W. Meredith at St. Francis Hospital, and my own at Presbyterian), and with an even lower morbidity and mortality of 0.7% and .03% respectively. (See Table I.)

Table II

	1920	1921
Lobar pneumonia	45	8
Broncho pneumonia	7	6
Bronchitis	7	2
Pleurisy:		
Dry	7	
Serofibrinous	2	
Empyema	1	
Pulmonary embolism	2	
Pulmonary abscess	0	1
	71	18

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*Read in Surgical Section, Ontario Medical Association. June, 1921.

The series shows the usual preponderance of pneumonia, this time nearly equally distributed between the lobar and lobular types. This corresponds more nearly to the findings in other clinics though Cutler (9) in 1,600 cases at the Brigham Hospital this last year has found only one case which he has called lobar pneumonia.

It is beyond the limits of this paper to enter into a full discussion of the clinical course of the post operative respiratory tract complications so we shall present only a brief summary of some of the important features as we have observed them in order that we may more fully consider what to us is of more practical import their etiology and treatment.

Pneumonia is by far the most frequent and serious complication, in our series being responsible for 75% of complications and 90% of the mortality. Autopsy reports are scarce but those published show that there may be every known type of pathology including lobar, lobular, (broncho), embolic (infarction), gangrenous, hypostatic and lastly a type important and frequent which corresponds to a type of non-surgical pneumonia called by the French School, maladie de Woillez, and indeed resembles closely, as we have seen it, the gross appearances of influenzal pneumonia. In this type the characteristic features are marked engorgement of the pulmonary vessels, and unorganized exudate in the alveoli containing little or no fibrin. Grossly such a lung looks and feels beefy, is heavier than normal, is slightly crepitant, exudates frothy reddish fluid and presents no evidence of hepatization.

Clinically on the basis of physical signs, we distinguished the lobar and broncho types, and again, depending on the time of onset several more or less well defined groups. (1) Those cases developing immediately after operation or within a forty-eight hour period. (2)—Those developing within the first week after a post operative period. (3)—Those of a later stage of convalescence. (4)—Those that were terminal in type occurring in debilitated individuals usually as an ante-mortem incident, and discovered at least once at autopsy. These terminal cases showed no frank physical signs except those of circulatory stasis and were not associated with cough or rise in temperature.

Cases developing during the surgical convalescent period were not apt to be severe in type or outcome unless associated with some exhausting surgical condition. One of our cases with fecal fistula secondary to suppurative appendicitis developed a lobar pneumonia on the twenty-fourth day after operation and died in four days.

Much more frequent and severe are those cases which came within the immediate post-operative period—that is the first two days. They comprised in our series 62% of all the pneumonias as compared with the 27% which began in the three to seven day period and 10% which started in the convalescent period. These cases have often been called "ether pneumonia," but improperly so, for we know that while some of them belong to an irritation class they are not necessarily the result of anesthesia. In this group there was a sharp rise of temperature to 102°-104°, usually without chill, associated with increased frequency or respiration cough in the majority of cases, with or without muco-purulent sputum, but occasionally rusty. About 20% had pain in the chest. The physical signs appeared within twenty-four hours perhaps only as localized rales and diminished breath sounds which cleared up in several days or went on to definite dullness, bronchial voice and breathing. These signs of consolidation often persisted after defervescence, which occurred by lysis in 90% of cases that recovered in from three to ten days—Whipple (10) believes, as we do, that many of the sharp temperature rises in the forty-eight hour period, and usually considered as normal postoperative reaction, are really cases of postoperative pneumonia. They are not diagnosed as such because physical examination is not thorough or because they do not have physical signs frank enough to be recognized. Whipple (10) found the X-ray helpful in locating lesions of this sort and in many of these early cases a rather characteristic appearance in the lung of a wedge shaped shadow with base directed downward and outward toward the periphery of the lung, and apex toward hilum. This, however, we believe is the characteristic appearance of early lobar pneumonia of any type. The helpfulness of X-ray in diagnosing obscure or doubtful pneumonia, or even the type of pneumonia cannot be over estimated, though it is a method not open to universal application, since for the safety of the patient it necessitates the use of an excellent portable X-ray apparatus.

Cases which developed in the third to the seventh day differed little in their clinical course from non-surgical pneumonia with this exception, that a certain percentage in our series, as was true of the forty-eight hour group, did not have subjective symptoms. With their quiet breathing only slightly accelerated, good color, and moderate temperature, they might easily have escaped the diagnosis of pneumonia had it not been for physical signs. These cases do well, and are responsible perhaps for the deep seated impression in the minds of many surgeons that postoperative pneumonia is not a serious matter.

Cases which developed in what is the surgical convalescent period fell into one of two categories (1)—a group the result of exposure and chilling, which ran an ordinary course and (2)—a group which may fairly be said to have been the result of embolism—with resultant pulmonary infarction. The onset here was sudden with severe and persistent pain with slight cough and sputum slightly blood tinged.

Pleurisy—Eleven cases occurred either as a primary lesion or several times as a sequela of a postoperative pneumonia and presented three types, dry, sero-fibrinous, and suppurative. Most of the dry cases developed in the second week after operation and were evidenced simply by pain in the chest with or without friction rubs, and usually without elevation of temperature, pulse or respiration. Pleurisy with effusion and empyema on the other hand occurred earlier and most commonly when there was a localized or general upper abdominal peritonitis affording an immediate source of infection via lymphatics. It is rarely that empyema follows a postoperative pneumonia. The seriousness of pleurisy attaches to the suppurative type. For example, Burnham (11) in his study as they occurred at the Presbyterian Hospital in New York reported six empyemata all fatal.

Bronchitis—Occurs as a complication after operation much more frequently than is recorded in clinical records, so that the figure of nine cases, as given, represents only severe lesions. At least three instances with purulent sputum containing pneumococci bordered upon bronchopneumonia, though there were no definite physical signs of consolidation. X-ray, had it been utilized, might have demonstrated pneumonia. It is quite exceptional for bronchitis to result fatally though one in our series did die ten days after a cholecystectomy under ether of one hour's duration.

Lung Abscess—We believe occurs very seldom in general surgery. The one case of our series was secondary to a lobar pneumonia, which developed immediately following the repair of a gastrocholecystic fistula. The abscess began on the thirteenth day after operation and ruptured spontaneously two weeks later. This case ultimately died two months later from acute dilatation of the heart, following a secondary cholecystectomy and removal of common duct stone. Undoubtedly the cardiac weakness which developed was dependent upon the earlier pneumonia and abscess. In nose and throat surgery pulmonary abscess is a potential complication by reason of the likelihood of aspiration of foreign material from the mouth and throat, such as septic plugs from the tonsils. Lord (12) refers to an incidence of 10% in this field—though several laryngologists of large experience with whom we have communicated have never met with lung abscess.

Embolism of the Pulmonary Artery is usually grouped with respiratory tract lesions though it might be properly considered as a circulatory complication. Fortunately it is infrequent, for it is nearly always fatal. It happens at any time during a surgical convalescence without warning. It is indeed one of the tragedies of surgical experience. One of our two cases did survive, presumably because of either incomplete blocking of the artery or the plugging simply of one of its branches.

Pulmonary Tuberculosis—It is probable that operation itself is not responsible for the development of a pulmonary tuberculosis in an otherwise normal lung. At least we can find no record of such a happening. At any time that pulmonary tuberculosis does follow operation, it is because a healed or latent process has been lighted up. We believe that an active tuberculosis in the lung will be made worse or disseminated elsewhere if inhalation anesthesia is used.

Mediastinitis is a complication which did not occur in our series. Whenever it has developed it has been highly fatal. Cutler (1) refers to three such cases in his series from the Massachusetts General Hospital. Those cases are potential where surgery of the lower neck in the presence of sepsis, or instrumentation of the oesophagus and trachea and bronchi are carried out.

Pneumothorax is another infrequent complication and one which we have not observed. Obviously it may occur in operation on the chest wall and on the upper abdomen, if the diaphragm is injured. This is likely to happen in nephrectomy when the kidneys are adherent to the diaphragm especially because the pleural sac extends normally below the twelfth rib.

It is a serious event for an individual to develop a respiratory tract complication after operation. Even if he recovers it is at the expense of a prolonged convalescence, entailing an increased economic and sociologic burden upon the individual, hospital, and community alike. But about forty per cent do not recover. The rate is especially high where there is sepsis or cachexia, or where shock and hemorrhage have supervened. In our series of thirty-five deaths, there were twenty with acute pyogenic foci; in three, shock and hemorrhage; in three, cachexia, and in three, senility.

The question may be raised whether the respiratory tract complications themselves are responsible for the mortality. It would seem that in twenty-one of our cases or 60% that the complication was definitely the cause of death, and probably in eight more was the factor which overbalanced the possibility of recovery. Probably only six would have succumbed to their surgical lesion. Of the complications pneumonia, thrombo-embolism, and mediastinitis are the most prolific sources of mortality. Empyema too is highly fatal.

When one comes to a consideration of the etiology of the various lesions one is impressed by the number and variability of its factors. They can be divided at once into two general groups, predisposing and the exciting or bacteriological. The various predisposing factors in turn can be grouped into (1)—exogenous as they arise from environment or external causes. (2)—Endogenous which are concerned with the patient's physical condition, either general or local. In the order of their importance we believe that the exogeneous chief factors are (1)—Exposure of the patient. (2)—Anesthesia. (3)—Sepsis. (4)—Hypostasis in lungs from cardiovascular lesions. (5)—Thrombo-embolism and those factors depending upon it.

Exposure of the Patient to chilling before and after operation is, in our judgment, a most frequent contributory factor. The ways in which this actually takes place, whether before operation, in the operating room, during recovery from anesthesia or late in convalescence, are too well realized to need recording. They have to do with improper ventilation, (draughts), bed clothing, room temperatures, and wearing apparel. We are familiar with the infection of the nasal passages and pharynx, which often follows exposure of local surface or general body surface to chilling. In an analogous way, undoubtedly, the lower respiratory tract is affected. The mechanism of this is perhaps not proved and rather a matter of speculation. It is usually ascribed to a congestion as a result of vasomotor depression through the sympathetic nerves. The equilibrium between the host's power of resistance and bacteria is upset to the point that bacterial invasion takes place. Meade and Grant (13) conducted some experiments by a thermo-galvanometric method to determine the effect of lowering of surface temperature upon the nasopharynx. They found that chilling of body surface causes a reflex vaso-constriction and ischemia instead of congestion of the nasal and pharyngeal mucosa, which is the opposite of what is usually believed; and contrariwise that warming of body and face cause a corresponding dilatation of the vessels. The decreased cell respiration which ensues, retards removal of products of cell metabolism, and decreases the supply of specific antibodies. Jonathan Wright (14) too, believes that some similar biochemical charge is antecedent to infection. Another factor may be the increase in volume of respiratory exchange which results in local depression of the temperature of the mucous membrane, rendering it more susceptible to bacterial attack.

Huntington (14) in a study of temperature and humidity as it affected post-operative cases, came to the conclusion that a proper humidity is really more important than a warm temperature for the well being of the patient. He suggests that immediately after operation the relative humidity should be 80° or more and then gradually diminished so that in a few days it averages 60% when the temperature is 64°. He based his findings on a study of mortality statistics in two Boston Hospitals. While not conclusive and taking no regard of other factors they are quite suggestive. After all there may be some advantage to the patient to have steam from an adjacent sterilizing room pouring through to the operating room, even though it makes for the considerable discomfort of the operator.

Anesthesia—Inhalation anesthesia, especially ether, has been blamed from time immemorial as the cause of post-operative pneumonia and bronchitis. While it is true that a few cases may be justly attributed to anesthesia, most can not be. There is much evidence to bear this out. Complications follow all types of anesthesia—local and spinal as well as inhalation, as any anesthetic records will show. Gottstein (15) and Henle (16) for instance, reported in a series of laparotomies that more pneumonias followed local than general, though with less mortality. It must not be forgotten, however, that oftentimes local anesthesia is chosen because of the grave physical condition of the patient, or because of evidence of recent respiratory tract infection, either one possibly being the factor responsible for the pneumonia. In our own series of eighty-five cases, as shown in Table IV, ether was given in sixty-nine, novocaine was used in six, spinal in seven, and chloroform in three.

The incidence per cent, however, shows a morbidity quite alike for both novocaine and ether. Nitrous oxide escaped entirely, and while it is not etiologically immune, it is, in our experience, less likely to stir up irritation than either ether or chloroform. If, however, there is a suspicion of respiratory tract inflammation present, we feel that inhalation anesthesia is to be avoided.

TABLE IV—ANESTHESIA

	Ether	Spinal	Novo-Caine	Nitrous Oxid	Ethyl Chloride	Chloroform
Lobar Pneumonia	45	6	2			2
Broncho-pneumonia	9		2			1
Bronchitis	8					
Pleurisy	8	1	1			
Empyema	1					
Pulmonary Abscess	1					
Pulmonary Embolism			1			
Total	69(73)	7	6	0	0	3
Total Anesthetics	5971	1245	649	145	21	36
Incidence %	1.1	0.6	0.9	0	0	8.3
Cutler—Hunt	3.4	0	1.7	4.4		0

Further evidence that anesthesia is not responsible for respiratory tract complications is found in the circumstance that many cases in which ether is taken badly, where there is much mucus, dyspnea, and cyanosis involving an obstructed air way to the lung, do not develop any trouble, and conversely that complications sometimes follow technically perfect anesthesia. This, however, does not lessen the responsibility of the anesthetist or the desirability of a smooth anesthesia free from cyanosis, vomiting and mucus. Aspiration of throat contents, that is mucus and food mixed with pathogenic bacteria such as pneumococcus, streptococcus, undoubtedly at times is a contributory factor. Holscher (17) conducted a number of experiments with reference to the role of mucus. He showed that mucus travels via the bronchi to all parts of the lungs if the head is not held over on the side and the mouth is not properly drained; and that if there is any obstruction to respiration, the violence of breathing causes increased aspiration of mucus. If, however aspiration alone were a great moment we are sure that more pneumonias and lung abscesses would follow tonsil operations than are reported, inasmuch as in this type of case there is excellent opportunity for the descent into the bronchi of foreign material. Some have averred that the time element in anaesthesia is an important factor, but we are quite certain that expert administration is very much more essential.

Type of Operation including operative technique. How much responsibility attaches to the type of operation and location of operative field is a matter of opinion. Statistics all seem to show that complications follow abdominal operations more frequently, even four to five times so, than elsewhere. In our series the record was abdominal 59, hernia 12, head and neck 6, extremities 7, thoracic wall 1. This may be due to the frequency of abdominal sepsis. It may more reasonably be accounted for by the diminished aeration of the lung and inability of the patient to cough out mucus freely, which follows the limitation of diaphragmatic excursion in this field, and is incident to trauma of rough retraction, or the application of tight binders and dressings, or abdominal distention, or the pain which results from incisions close to the ribs.

We have not found that the season of the year, age, or sex of patient, are factors of any great moment. There is, however, a tendency for incidence to follow respiratory tract epidemics. For instance, during the influenza epidemic of 1918 the incidence of post-operative respiratory disease in the army camps e.g. at Camp Custer kept pace with non-surgical inflammations

In a consideration of endogenous predisposing causes we feel sure that *infection in the respiratory tract* is a most, if not the most, prolific factor. It needs only assertion to establish, though evidence is concrete, that an infection recently subsiding or subacute such as coryza, or laryngitis, can and does cause further complication after operation. Certainly no patient thus afflicted should be operated upon unless in case of extreme emergency and then with more than usual precautions. The evidence is not so clear in the matter of chronic inflammatory lesions such as chronic bronchitis and emphysema. They undoubtedly are predisposing factors, especially if they are associated with the hypostasis of cardio-vascular insufficiency. There is little doubt too that hypostasis alone, such as for instance occurs in myocarditis, enhances bacterial invasion.

Sepsis is also a very important predisposing factor, and acts in one of two ways either in impairing the patient's power of resistance, or affording a focus from which infection may travel to the lungs by blood stream or the lymphatics, presumably as septic emboli. That this does happen is true, particularly in septic conditions in the upper abdomen where there is possibility of direct extension from the subphrenic abdominal viscera and peritoneum, but we feel sure that emboli, septic or non-septic, are not as frequent a cause as Cutler, for instance, would have us believe. His arguments for emboli as a primary and universal etiologic factor may be summarized as follows: Thrombosis takes place in every operation especially in septic fields. Emboli are split off by movements of the body and the operative handling. In abdominal operations, especially in the epigastrium, the conditions are suitable, namely perpetual motion of the diaphragm, frequent sepsis, and direct anatomic channels, and it is this field that shows the highest incidence. He makes this interesting statement, but in our opinion a speculative one, "If we have a subacute lung condition and shower into it fine emboli, even if not septic, they will cause sufficient circulatory pressure disturbance to cause the existing latent process to flare up."

Careful consideration of the evidence leads us to disagree with the embolic view point, not so much on anatomical grounds for we believe that the anatomical channels of communication of both the lymphatics and venous system are well established. The lymphatic vessels from the mesentery, liver and stomach either pass through the diaphragm directly to the anterior and posterior mediastinal nodes and thence into the bronchial lymph nodes, or they pass into the thoracic duct and ultimately in this way drain into the lungs. Then the mesenteric veins, which are tributary to the portal system, anastomose freely with the gastric, oesophageal, retroperitoneal and hemorrhoidal veins, in this way affording a certain though indirect portal of entry to the lungs.

It is rather on bacteriological, pathological, and clinical grounds, that we feel that embolism is an infrequent rather than constant factor. The bacteriology of respiratory tract complications has been studied as far as we know only by Whipple (10) and Cleveland (18). Their findings with reference to postoperative pneumonia are registered in Table III. It will be seen that the pneumococcus is responsible for the majority of cases. Inasmuch as the habitat of the pneumococcus is the respiratory tract and not the abdominal cavity, the large number of pneumococcus cases occurring in abdominal operations can not be explained on the basis of septic embolism. We could account for streptococcus pneumonia in this way. But why should we not have, as we do not, a large number of colon bacillus infections of the lung, since this is a predominant organism in abdominal sepsis. The last word on the etiology of pneumococcic lobar pneumonia and streptococcus lobular pneumonia has come from Blake and Cecil (19) in their experimental work with monkeys, in which animals pneumonia develops and runs a clinical course comparable in every way to the human type. They found that the trachea and bronchi are the portals of entry for the bacterial invasion of the lung whether pneumococcus, streptococcus, or influenza bacillus. From the trachea the organisms proceed by the lymphatics to the bronchial lymph nodes at the hilum of the lung and thence by the lymphatics about the vessels and bronchi to the interstitial tissue beginning at the hilum and extending to the periphery of the lung.

Table III—Sputum Examination

	Preoperative	Postoperative
Cases examined by mouse inoculation	85	130
Cases not examined	77	32
Group I, pneumococcus	2	4
Group II, pneumococcus	5	5
Group III, pneumococcus	8	10
Group IV, pneumococcus	30 (35%)	80 (62%)
Group III and IV	0	1
B. influenzae	1	5
B. mucosus capsulatus	3	7
B. mucosus capsulatus and pneumococcus 4	0	1
Streptococcus	3	10

They found also that subcutaneous and intravenous injections did not produce pneumonia; in other words that pneumonia is bronchogenic in origin and that invasion of the blood stream, though early, is secondary to invasion of the lung, which is quite definite evidence, it would seem, that the blood stream carrying emboli is not the etiologic factor. Clinically, on the embolic basis, it is hard to account for lesions like generalized bronchitis or pneumonia which follow a perfectly clean hernia operation done under local anesthesia, or for the fact that pneumonia involves usually only one lung and one lobe of that lung.

From what has been said, we do not wish it understood that we disbelieve in embolism as a factor in postoperative respiratory tract disease, for we know only too well of definite instances, and also cases of pulmonary infarction, and of thrombo-embolism, of the pulmonary artery. For the development of thrombo-embolism, we must go back to those factors which predispose to them, such as local infection, anemia, slowing of the blood stream, excess of calcium salts in the blood, inefficient hemostasis, traumatization of tissues and injury to blood vessels.

From our study of the etiology of the postoperative respiratory complications, we have come to believe that there is no constant or essential predisposing factor. In our series, we were reasonably certain of etiology in only twenty five of our eighty-five cases. In six of these, ether was taken rather badly, two had general sepsis, ten had preoperative inflammation in the respiratory tract, two had evidence of chronic bronchitis. Undoubtedly, in a certain number, exposure was the factor. There was one striking illustration of this in a man who was allowed out of bed sixteen days following an appendectomy for acute suppurative appendicitis. His operation wound had healed kindly. On the third day after being up, he sat by an open window, had a chill that night and ran a pneumococcus group III, pneumonia, in the left lower lobe, terminating by crisis on the fifth day.

In view of the fact that there is no essential predisposing cause we have felt possibly, though it is a matter of speculation, that the crux of etiology is really after all a question of individual equation, and has to do with that indefinable intangible thing we term vitality or power of resistance. It is the thing that explains how one set of individuals in good physical condition and handled with extreme care in a technical way, develop respiratory tract infection while another group in poor physical condition, taking anesthesia badly, traumatized by operative techinque and perhaps even having septic foci, escape.

We have endeavored to establish for ourselves, those cases that may be definite respiratory tract risks. They include the following groups: (1)—Those with a history or evidence of recent acute inflammation. (2)—Those with chronic lesions, such as bronchitis and emphysema. (3)—Those with pulmonic hypostasis, whether of cardio-renal origin, or due to cachexia and old age.

In view of this uncertainty in etiology it behooves us all to take all precautions that we can, to eliminate or reduce the morbidity and mortality of respiratory lesions. In our work, we are trying to carry out the following prophylactic regime.

(A)—*Before Operation*—(1)—Histories are taken and physical examinations are made with special reference to the respiratory tract, and in this way we have discovered operative risks which had led us to postpone the operation—choose our anesthesia with special care and even pass the operation by, entirely.

(2)—Nursing rules designed to prevent exposure of the patient after his admission, are carried out carefully as practicable, and have been responsible for the prevention of upper respiratory tract infection before operation. These rules are modeled after those adopted in the Presbyterian Hospital, New York, and recorded by Whipple (10). They include the following—(1)—A temperature of 70° for the bathroom where routine admission bath is taken. (2)—Patients after their bath are kept in bed if they are to be operated upon the next day. (3)—Sufficient blankets and beds and suitably warm clothing are provided. (4)—Draughts are avoided at all times. In a recent personal communication, Whipple testified to the value of these precautions as follows, "these nursing rules laid down in my papers and followed carefully over varied periods, have shown very definite results in the prevention of colds before operation. A staff which is trained along these lines and which is impressed by the importance of watching out for complications, is very keen in detecting the cases of upper respiratory tract infection. It has been definitely proven that patients on a service where this is not done, have a higher pneumonia incidence."

Counter irritation of the chest with camphorated oil, both before and after the operation, has been quite faithfully carried out in the past year, but without appreciable effect, and this corresponds to Whipple's experience in New York. We are frank to confess a doubt as to the rationale of this procedure as a preventative measure.

(4)—The anesthetic is chosen with the care that the respiratory tract condition demands quite as much as the cardio-vascular-renal condition. This has led us to use less inhalation anesthesia, spinal more frequently, and in several cases, ether by rectum with, we believe, definitely improved results.

(5)—Oral hygiene is insisted upon; whether this has been of advantage, is uncertain. At least, it has done no harm.

(B)—*During Operation*—(1)—Further precautions are taken against draughts and chilling of the patient with wet solutions. No case leaves the operation room without a dry warm night gown and properly warmed blankets.

(2)—Anesthesia is given by those who are trained especially for it.

(3)—The surgical technique is designed to eliminate the etiologic factors of thrombo-embolism, as suggested by Ochsner (20). It includes careful asepsis, perfect hemostasis, avoidance of undue traumatization of tissue, especially by gentle retraction, and of needless injury to veins of the extremities by faulty positions upon the operating table. We have been much interested in Oschner's suggestion that transfusion of whole blood will help to prevent thrombo-embolism, though we have not carried it out routinely.

(4)—Dressings, especially those over the upper abdomen, are applied snugly, but not so firmly as to restrict respiration. Abdominal binders as a routine, have been discarded.

(C)—*After Operation*—Further protection against exposure is carried out. For instance, those cases in Fowler's position are properly jacketed. Free movement in bed is encouraged and elevation of the head and thorax from the flat position carried out, especially in those cases where there is any tendency to hypostasis in the lungs.

Whipple has written us that in the Presbyterian Hospital, New York, following a suggestion made by the consulting anesthetist, Dr. Thomas Bennett, they are routinely turning their patients on the right side till out of the anesthetic, with lessened incidence. The advantage of course, comes from a diminished chance of aspiration of mucus and vomitus.

As we have reviewed our morbidity of this last year since we have put this regime force, we know that the incidence of postoperative respiratory tract complications has been less. It is interesting to note that the five cases which have occurred in my own service at the Presbyterian Hospital were definitely the result of some carelessness, or infraction of the rules we have laid down.

If pneumonia or other complications develop, we believe that the principles of treatment of non-surgical pneumonia or lesions should hold sway. Those in our judgment essential, are good nursing, plenty of out door air, not necessarily cold, forcing of fluid intake especially water, ample cleansing of the intestinal tract and enough digitalis or caffeine to support the heart, and enough sedatives to relieve anxiety and pain.

In conclusion, we wish simply to reaffirm that respiratory tract complications after operations, constitute a distinct menace to the patient. We feel sure they can be minimized by a painstaking prophylactic regime, even though there is no constant etiology.

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SOME WORK WITH BLOCK AND LOCAL ANAESTHESIA*

H. O. Howitt, M.D., M.R.C.S.

Guelph, Ontario.

In the Fall of 1917, I read a paper entitled, "Some work with minor anaesthesia," before the Academy of Medicine, Toronto. It was published in the "*Canada Lancet,*" in February, 1918. It dealt with minor and major surgery, and reported nine different major operations without general anaesthesia. They were:

1.—Appendectomies.
2.—Two cholecystotomies.
3.—Mastoids.
4.—The tapping of the bowel, and the performing of a lateral anastomosis around the site of obstruction.
5.—Re-section of ribs for empyema.
6.—First stage of the prostate operation.
7.—The removal of a large calculus from the bladder.
8.—An operation on the stomach.
9.—A thyroidectomy.

The first appendectomy with "Local Anaesthesia," was done in 1913 with Dr. McAndrews of Georgetown. There was no mortality in the above series.

Early in the Spring of 1921, the newspapers, with heavy type, carried despatches from London, and Galt, making the statement that an appendix had been removed under "Local Anaesthesia." I was under the impression that such events had been so common, and done so many years previously, the comment was no longer to be expected.

I have glanced over some of my notes and find that subsequent to publishing that paper, other operations have been added to the list. They are:

1.—The opening and curretting of tibias.
2.—Operations for ischiorectal abscesses.
3.—Varicoceles.
4.—Hydroceles.
5.—Varicose veins.
6.—Haemorrhoids.
7.—Ventral hernias.
8.—Removal of breasts.
9.—Inguinal hernias.
10.—Removal of foreign bodies, as shrapnel.
11.—Rodent ulcers.
12.—Cancer of the lip.
13.—Ligation of thyroid poles.
14.—Opening and draining of peri-nephritic abscess.
15.—Colostomy, and considerable minor surgery.

The Local Anaesthetic

Novocain is the drug used for "Local Anaesthesia." It is eight times less toxic than cocaine. Its toxicity is again lessened by the addition of adrenalin, which delays absorption.

During the war, German patents were discarded, and we were offered, novocain, under the various other names, but, with one exception always, chemically the same drug. Each manufacturer selected a trade name for it and put it up in powder, or tablets of varying strengths, and with, or without adrenalin or sodium chloride.—In using these tablets, it is necessary to know their contents, because, depending on the manufacture, some only require the addition of sterile, or distilled water. With some it is necessary to make the solution with normal saline, and with others to add adrenalin.

1.—Procain, (Abbott)
2.—Anocain, (Wingate Chemical Coy.) are the best known of American and Canadian origin. Anocain is made in Montreal. One tablet to a c.c. makes a 2% solution, or roughly, two tablets to an ounce makes a ½ solution.
3.—Novocain, (the Saccharin Co., London) is the best known of English manufacture. It is chemically, para-amino-benzoyl-diethyl-amino-ethanal.
4.—Apothesine, (P. D. & Co.,) chemically differs from novocain. It is (diethyl-amino-propyl-cinnamate.) and the makers claim it has antiseptic properties.

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*Read at Surgical Section, Toronto Academy of Medicine, Nov. 15, 1921.

Toxicity—(Novocain)

The toxicity of this drug has really never been established. I have known a pint of ½% solution to have been used without any toxic symptoms. Of course the drug should be discarded if discoloured. The safest way is, to make a fresh solution and to add each time the adrenalin. It is advisable, when injecting it, to reduce the strength as the operation proceeds,—down to as low as ⅛ of 1%, or lower. In other words, to use as little as possible.

In May, 1921, I visited a number of hospitals in the middle west, particularly, at Rochester, Minn. I found them doing a great deal of work without general anaesthesia. Nearly 40% of the operations there, were being performed with "local and block anaesthesia." I was informed that twice as much was then being done, as four months before, in other words, general or ether anaesthesia was rapidly being replaced. It was not an uncommon thing to see ten thyroidectomies done by this method in a day. Practically all surgery above the clavicle, in the extremities, of the pelvis and perineum, was being done with "local and block anaesthesia," or a combination of the two. I was very much impressed with the excellent work they were doing, and especially with the technique of "block and spinal anaesthesia." It was interesting to see a brachial plexus, blocked for a breast operation. The breast itself, of course was anaesthetised with infiltration anaesthesia, and the axilla, by blocking the brachial plexus. A few minutes later, the patient without any apparent discomfort, would have a radical breast operation. Several times I witnessed a thorough dissection of the neck performed under block anaesthesia. Prostates were all removed with sacral, plus, "local anaesthesia," or occasionally by means of spinal anaesthesia.

In the past few months I have had occasion to perform quite a number of operations with "Local and block anaesthesia," including the following:

Hernia; appendectomy; goitre; caruncle (of the urethra); mastoid; varicose vein; removal of Calculi from the bladder; fistula in ano. I have trephined the skull three times, removing a large part of parietal bone to relieve brain pressure and have blocked the brachial plexus for operations on the arm and for breast cases.

In one case of an old empyema, a small catheter drainage tube had slipped into the cavity, the x-ray showed the tube distinctly. With local anaesthesia, I enlarged the sinus to admit easily two fingers. After searching the chest cavity with long forceps for an hour, I was able to remove the tube without excessive discomfort to my patient.

It is interesting to hear patients discussing various subjects with the nurses during the operation, or to even see them smoking while on the table. After you have changed your clothing, collected your instruments and visited your patient in his room, it is more interesting to note the absence of restlessness, shock, or vomiting. To find your patient with a smile and sometimes a hand stretched to grasp yours, or occasionally, content in reading some article. Of course this picture changes when the local anaesthesia has worn off, but the patient acts more as if the operation had been done some days, instead of a few hours ago. Just as patients are sometimes very nauseated with ether, and some are not at all, so with local anaesthesia, some suffer pain when the anaesthetic has worn off, and some do not seem to suffer at all. They seem to stand it better if they have not been starved. There are cases when nitrous oxide and oxygen helps wonderfully as an adjunct to local anaesthesia.

Just one word about vomiting.—We are all familiar with the vomiting which follows the taking of ether, and with the various types of vomiting, which are sometimes seen after an operation with ether narcosis. A type of vomiting not infrequently follows a major operation done with local anaesthesia. It is much less severe than with ether, but I do not think I have seen vomiting following an operation with local anaesthesia, unless morphine or morphine and hyoscine, had been injected as a prelude to the local anaesthesia. At present I have not made up my mind, whether this vomiting is not merely an idiosyncrasy to the morphine, and not due to the local anaesthesia, at all.

The contra-indications to local anaesthesia, seem to get less each year,—but vary with each surgeon. Two types of individuals that do not readily lend themselves to this method are children and the insane. Cases which a few years ago seemed impossible with this method, to-day are quite possible. Almost any patient, with almost any operation, can be a suitable subject for surgery, with local and regional anaesthesia. A man operating by this method, will do less work in a given time, and be much more fatigued after it, than after a similar amount of work with general anaesthesia. The strain on the surgeon is much greater, much more energy is expended, much more is taken out of him,—but, I think the patient gains.

Every surgeon cannot, and will not, be able to operate by this method. The type of surgeon who rushes through his work, "pulls" on mesentery, and roughly handles the tissues, etc., will only attempt it with failure. To the surgeon who has forgotten his anatomy, especially the anatomy of the nerves,—to him, it must be a sealed book. With the surgeon up in years, who will not "be born again," surgically speaking, it will never become popular. A new generation of surgeons, not yet in practice, will carry it to its proper plane. In the meantime the types of surgeons who can neither use nor learn to use it, may spend words in its condemnation, but neither *words* nor the *frowns* of the *mighty* will do more than delay the final determination of its proper place.

Of course I do not anticipate that ether will go into disuse, but feel that to-day it is frequently used when local anaesthesia, would be *safer*, and be more satisfactory. After all, our object is to get our patients well and to relieve pain. If we can do it better and more safely by avoiding general anaesthesia, then it should be our training and our duty to do it with "block or local anaesthesia."

Technique

Many books have been written on this subject, especially in recent years. It would be quite impossible to attempt to cover it in a paper like this. Briefly we have three methods of injecting:

1.—*Local*	(a)	Subdermal.
	(b)	Infiltration.
2.—*Block* (or Regional)....	(a)	Direct—(into the nerve sheath).
	(b)	Indirect (about and around a nerve sheath).
3.—*Vascular*	(a)	Direct into a vein.
	(b)	Direct into an artery.

It is well first to explain to your patient what you propose to do, really have a "heart to heart talk," explain the amount of discomfort and length of time it might have to be endured. For example: in a thyroidectomy, there will be considerable "choking" sensation and discomfort while working near the trachea, which will be uncomfortable but not painful. Each operation has its unpleasant moments, which can be made much less unpleasant if the patient is prepared in advance, when to expect them. Each different operative site has its own problems for technique. A nervous patient may require a pre-operative treatment of bromides, others morphine, or morphine and hyocine, and some require nothing at all. To be able to decide the requirements of a case is a question of judgment and judgment is the offspring of a well trained mind, mated happily with experience. Frequently it is advisable to inject morphine, or morphine and hyocine, one hour before the operation. The site where the Novocain is to be first injected is touched with a drop of carbolic acid, then, a fine *new* hypodermic needle is inserted, and the skin blanched with the anaesthetic solution. The rest comes easy through a long flexible needle attached to a larger syringe, (say 10 to 30 c.c.) the solution is injected into the required area,—and all is ready for the incision

It is a great advantage to have a nurse who can inspire confidence, or make the patient think of other things than the operation. The nurse sits in a chair usually occupied by the anaesthetist, separated with the patient, from a view of the operative field, by a screen. She sometimes carries on a running conversation, wets the patient's lips, give drinks of water, etc., but should inspire confidence.

I doubt if many will disagree with me, when I say that the day of general anaesthesia has passed (or is rapidly passing) as far as thyroidectomies are concerned, except for the severer cases which are benefited by the addition of nitrous oxide gas and oxygen. Often our chief thought in the non or slightly toxic cases, is the after appearance of the scar. "Local anaesthesia" has eliminated the wretched after effects of ether, lessened the shock and pain, and consequently, the operative mortality. I have performed thydroidectomies where the pulse did not advance more than 20 beats per minute and the patient slept four to six hours the first night. If other arguments are necessary, let me say one seldom sees now, anything but local anaesthesia, at the best known clinics, as Chicago, Cleveland, and Rochester.

Hernias are easily captured by the "Local" method. One can remove, varicoceles, hydroceles, open the vesical bladder, and perform all operations on the extremities. The skull can readily be trephined. Roughly, all operations above the diaphragm, and of the extremities are in the field of local anaesthesia. I do not recommend it as a routine for appendectomies, especially for those patients with a history of several attacks, or even for those with the first attack, although on the same day I have had three abdominal cases, request that I use local anaesthesia. Two had had past experience with ether, and the other was influenced by them.

Sacral or para-sacral anaesthesia, with or without a local, is sufficient for most gynaecological operations, and for those on the perineal and anal regions. Regional anaesthesia, is very useful. I have removed a large sequestrum from the humerus after blocking the brachial plexus, and the patient remained perfectly comfortable throughout. I have freely incised a badly infected arm, after blocking the brachial plexus.

Spinal Anaesthesia.—The nicest technique that I know of, is that used by Dr. Labat, late of rochester, Minn. He used "Rachi-neocaine," (Corbiere laboratories). This comes in ampoules of about 5 c.c. capacity, but contains only the rachi-neocaine in the dose required. The firm supplies an isotonic (?) fluid with which the solution is made up for injecting into the cord. His method was to break the neck of the ampoule and to let the spinal fluid run directly into it and mix with the neocaine, then to re-inject the spinal fluid and neocaine into the cord, taking care of course, to permit more to escape than was necessary for making the solution. In a few minutes the patient would note the tingling sensation in the legs, and then later the loss of sensation, then the patient would lie on the operating table, sometimes in the Trendelenburg position, with gravity ignored. I might say that very little more can be accomplished with spinal anaesthesia than with sacral plus local anaesthesia. That being the case, it is doubtful if spinal anaesthesia is often justified, because sacral plus local anaesthesia eliminates danger of the spinal method, and as a rule is ample for pelvic surgery.

EXAMPLES

1.—With the Drs. McQuibbon, of Alma, I saw a young man with a badly infected knee. Temperature 103°, pulse varying from 140 to 160. The man experienced excruciating pain with the slightest movement. With infiltration, the joint was opened and patella turned back, the joint then irrigated and drained. The operation undoubtedly caused him a great deal of pain, but the man said "that the pain was not nearly so great as when the first dressing was done."

Failures are frequently due to lack of judgment, for example:

2.—Recently I operated on a nervous French woman, for fistula in ano. Two years previously a Montreal surgeon had removed her thyroid under ether anaesthetic. She dreaded the anaesthesia, her nerves made her dread everything. I injected enough "Local Anaesthesia," to amputate her leg, but she cried out that I caused pain. Some distance from her body I then clicked two forceps together, she heard the metallic sound and cried out that I was hurting her. She wept when she returned to her room, but, shortly after, and ever since she has insisted that she experienced no pain. I would have shown better judgment had I given her bromides before operating.

3.—Dr. C. Laird, Southampton, assisting. A woman, 58, with gall-stones. She was in very poor health, some pain in the chest. With the fluoroscope, we noted an aneurism of the arch of the aorta. Under local anaesthesia, the gall-bladder was drained, and recovery uneventful.

4.—A man 84, with very foul urine. Stones felt in the bladder with sound. The man was in almost constant pain. With "Local anaesthesia" I removed a dozen stones, the size of marbles. He was in a wheel-chair in two days, and spent the rest of his time as an invalid telling his friends that "he was not aware that the operation had started until he was informed that it was over." He told me that "if I called that an operation he could stand eight of them a day."

5.—A stout man, about 50, with a right inguinal hernia into the scrotum, of fifteen years standing. After the operation, he offered to walk to his room, if I would guarantee that the stitches would hold. He went back in a wheel-chair, with a smile.

6.—At Orangeville hospital, with Dr. Dunning assisting. I saw a young man with advanced appendicitis. Very toxic appearance, rapid weak pulse. I removed the appendix, drained free pus, left in drainage tubes. Uneventful recovery.

7.—A woman, 40. Severe headaches, choked discs, vomiting without nausea, diplopia, poor pulse. The urine contained sugar. Dr. Wm. Goldie, saw her with me. He diagnosed a subtentorial tumour, and that she would not live long. He urged decompression, for relief of symptoms. Relief came as anticipated. She lived in comfort for two weeks, and died in coma as a result of the tumour. An interesting thing about this case is, that the parietal bone was $\frac{9}{16}$th of an inch in thickness. Our ronguers would not grip it. I had to work with trephine chiefly, assisted with hammer and chisel. When returned to her room, she said, "that the operation was painless." Dr. Bennetto of Guelph assisted. Our forearms were sore a few days from trephining.

8.—Dr. Kerr of Elora assisting. A man 55, with Jacksonian epilepsy, and with spastic paralysis of right arm of long standing. The veins in the scalp were numerous and large. His family urged the operation as they said he was rapidly growing worse. He died twelve hours after the operation. Although $\frac{1}{5}$th of 1% solution was used in his case, I have wondered if sufficient could have gotten into the circulation through a vein to have had any bad effect. I took this question up with a surgeon more experienced than myself with "Local anaesthesia." He said, "Decidedly, no."

9.—The thyroidectomies were uneventful, except the first, which, in my opinion, was long and tedious. Experience made it easier for the others. All of them said they would not fear it again. One was up in two days, and home in five. The others were not much longer.

10.—A woman, 60, with high blood pressure. She had had several abdominal operations and said she would "rather die, than have ether again.' She had a protruding urethral caruncle, and distress on micturition. With parasacral and local anaesthesia, the caruncle was removed without difficulty.

11.—A woman, aged 50, had a urethral caruncle, and haemorrhoids, which were removed with the same method, and same result.

12.—A "Loretto Sister," thin and not strong. History of several appendical attacks and of a recent one a few days before. A mass was easily felt in right lower abdomen. I removed a gangrenous appendix, and drained. Gas-oxygen, was used when the adhesions were separated. She made a splendid recovery and assures me that she had not experienced pain at the operation.

13.—A man, 48, with bad bronchitis, developed acute appendicitis. In error he had been given $\frac{1}{30}$th strychine before the operation instead of a sedative and so "gas-oxygen" was used when the wound was being closed. In this case, I consider it would have been wrong to have given ether.

14.—A young man had had appendicitis about ten days before I saw him; very toxic appearance. The caecum was found to be several times its ordinary thickness. The appendix was perforated at its caecal end. He complained of pain from adhesions when I raised the caecum. His recovery was uneventful. Gas-oxygen, could have been used to advantage.

15.—A young man with skull injury over parietal area several years previously, which had been followed by "Jacksonian" epilepsy, of the arm of the opposite side. He had one or more attacks a day. I operated four months ago for pressure irritation. Up to the present he has been free from attacks.

16.—A man of 50 years of age with tabes dorsalis. The bladder had lost its power to expel urine. A soft catheter could not be passed. It was thought advisable to drain the bladder, so without removing him from his bed, the bladder was opened without any difficulty, and without any subsequent memories of pain.

In my paper of four years ago, I made several deductions which have been borne out by experience. There are cases where general anaesthesia is contra-indicated, and where it would be the height of cruelty to revert to the experiences of pre-anaesthetic days. In these cases, I think all will agree that local and block anaesthesia are indicated. Just what is the future of local anaesthesia I am not prepared to say, but I think it has its field, and a greater future than most surgeons now admit.

Pregnancy after Nephrectomy—According to Matthews (*Amer. Journ. of Obstet. and Gynec.*, March, 1922) pregnancy in a woman from whom one kidney has been removed is little more hazardous than in normal women, providing the remaining kidney is functioning properly. Albuminuria may occur as in normal subjects during the later months of gestation, but responds to treatment as well as that of subjects having two kidneys. Marriage and pregnancy after nephrectomy are permissible if tests have shown the remaining kidney to function normally for a year or more, or for three years or more in cases in which the nephrectomy was performed for unilateral renal tuberculosis. In 241 cases of nephrectomy taken from the literature or studied personally the writer found 265 pregnancies, with 250 normal labours and only 2 deaths; 60 per cent. of the patients showed more or less albuminuria during the later months of pregnancy. These patients tolerate morphine well, and may be subjected to other forms of anaesthesia than that by chloroform; chloral hydrate and veronal are borne badly by them.—*Brit. Med. Jour.*, May 13th, 1922.

A STATISTICAL STUDY OF FERMENTATIVE DIARRHOEA, INFECTIOUS DIARRHOEA, ACUTE INTESTINAL INTOXICATION AND DECOMPOSITION OCCURRING IN THE HOSPITAL FOR SICK CHILDREN, FROM OCTOBER 1ST, 1919, TO OCTOBER 1ST, 1920, CONSIDERING ESPECIALLY THE RELATION OF AGE, WEIGHT AND PARENTERAL INFECTIONS TO MORTALITY.

M. A. Cox, M.B.

Toronto

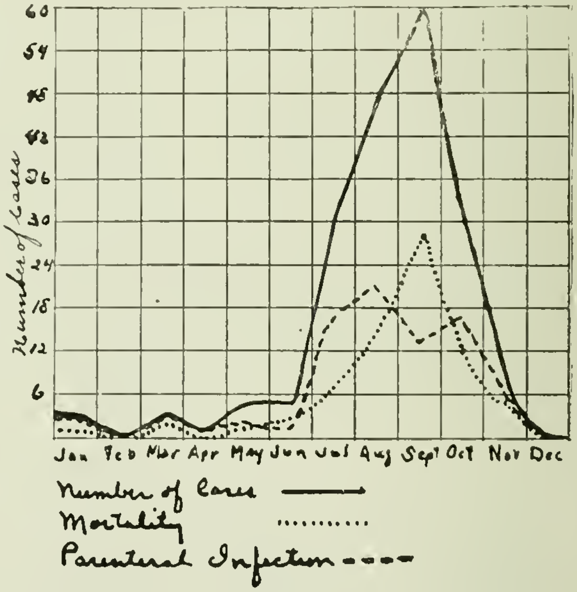
Fermentative Diarrhoea

THERE were 190 cases of fermentative diarrhœa treated in the Hospital for Sick Children during the hospital year 1920. Of these 105 were cured, 12 cases removed after improvement, 2 were removed unimproved, 71 died, a mortality of 37½ per cent. There were 16 cases complicated by nasopharyngitis alone, 39 by otitis media, 7 by bronchitis and 20 by bronchopneumonia. Since some of these children had more than one infection, there were thus 32 per cent. which developed a parenteral infection either before or after admission to hospital. The average duration of illness before admission to hospital was 9½ days while the average stay in the hospital was 20 days.

There were 17 cases admitted in a moribund condition with a mortality of 100 per cent. 107 cases admitted acutely ill had a mortality of 42 per cent. and 62 cases not seriously ill had a mortality of 14½ per cent. The 4 cases admitted when not really ill were all discharged cured.

The number of cases each month, the monthly mortality and the monthly incidence of parenteral infection are illustrated by a combined chart on the last page. I might say that the monthly incidence of cases and parenteral infection corresponds fairly accurately with statistics compiled by Morgan (1) in 1914 and 1915. In his series of cases the percentage of complications in 1914 was 45 per cent., in 1915 was 27 per

CHART I

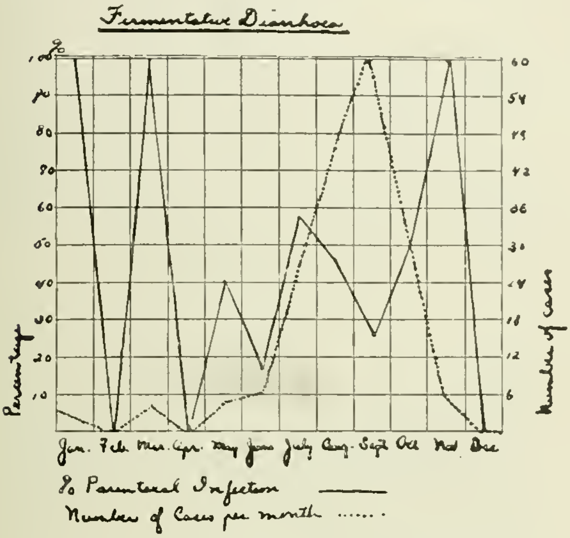


Fermentative Diarrhoea

No. of Cases	No.	Mortality	No. of Cases	No.	Mortality
Under 3 months	27	48 per cent	Under 6 lbs.	13	77 per cent
3 to 6 months	60	43 " "	6 to 8 lbs.	35	40 " "
6 to 12 months	63	38 " "	8 to 10 lbs.	37	40 " "
Over 12 months	28	33 " "	Over 10 lbs.	105	30 " "

cent., and in 1920 it was 32 per cent. The mortality in his cases, however, in 1914 was 61 per cent., and in 1915 was 48.6 per cent. compared with our mortality of 37 per cent. Morgan, however, in his series included infectious diarrhœa as well, which condition when added to our statistics decreases our percentage of complications without increasing our mortality.

CHART II.



Of the parenteral infections considered, broncho-pneumonia had the greatest mortality per number of cases. Otitis media had the second highest mortality. Nasopharyngitis and otitis media were the most common complications.

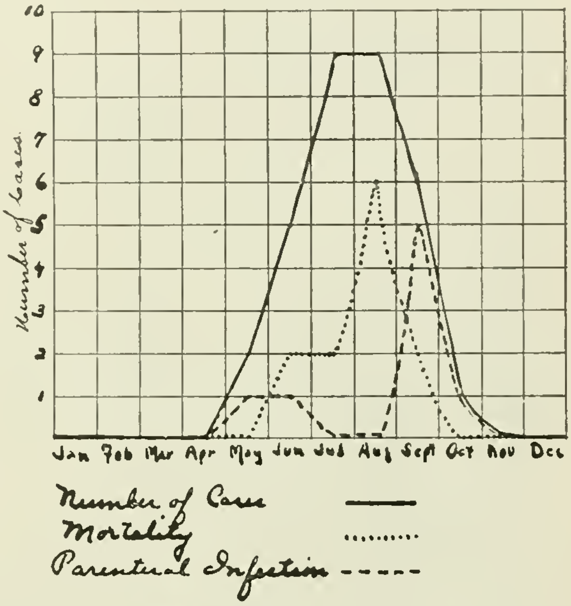
Note: The percentage of cases having a nasopharyngitis would undoubtedly have been greater had we been able to ascertain more accurately the condition of the patients prior to admission.

The inability of very young infants (*i. e.* under 3 months) of low weight, (*i. e.* under 6 lb.) to readjust themselves in the presence of a fermentative diarrhœa, especially in the summer months, and particularly if proper treatment was withheld until the child was either moribund or acutely ill, seemed a greater factor than the intervention of a parenteral infection in increasing the mortality. (Had the younger children lived longer they would probably have had a higher percentage of parenteral infection.)

INFECTIOUS DIARRHOEA

There were 32 cases of infectious diarrhœa treated in the hospital year 1920. Of these 20 were cured and 12 died, a mortality of 37½ per cent. There were just 6 cases complicated by parenteral infection or 19 per cent. This low incidence of complications is found in practically all statistics on infectious diarrhœa, especially is this true of the papers written by Morgan(2).

CHART III.



The complications in our series were: 5 instances of otitis media and 1 of broncho-pneumonia. The average duration of illness before admission was 6 days. The average stay in hospital was 18 days,

The one case admitted in a moribund condition died, of the 19 admitted acutely ill 53 per cent. died, and of the 12 cases admitted "not seriously ill" only one died, or 8 per cent. (For the monthly incidence of cases, complications and mortality, see chart at the end of the article).

INFECTIOUS DIARRHOEA

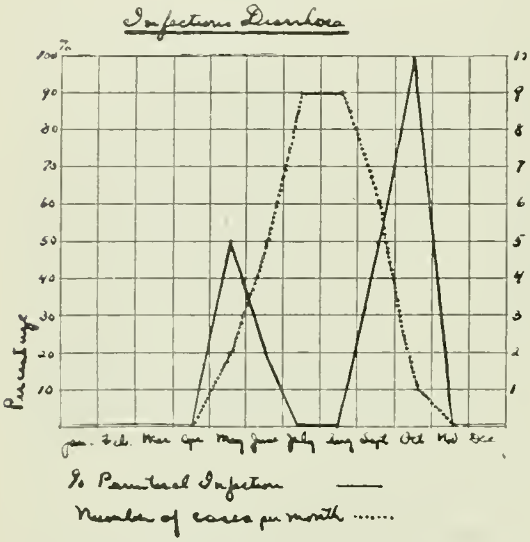
No. of Cases	No.	Mortality	No. of Cases	No.	Mortality
Under 3 months......	0	0	Under 6 lbs..........	0	0
3 to 6 months	3	100 per cent.......	6 to 8 lbs.	1	100 per cent.
6 to 12 months	4	25 " "	8 to 10 lbs.	0	0
Over 12 months......	25	32 " "	Over 10 lbs..........	31	35 " "

Acute Intestinal Intoxication

No. of Cases	No.	Mortality	No. of Cases	No.	Mortality
Under 3 months......	3	100 per cent........	Under 6 lbs.........	0	0
3 to 6 months	8	62½ " "	6 to 8 lbs.	10	60 per cent.
6 to 12 months	19	63½ " "	8 to 10 lbs.	3	66 " "
Over 12 months......	16	43 " "	Over 10 lbs.........	33	57+ per cent.

The greatest number of cases occurred in the summer months just as in fermentative diarrhœa. There were none during the colder months.

CHART IV.

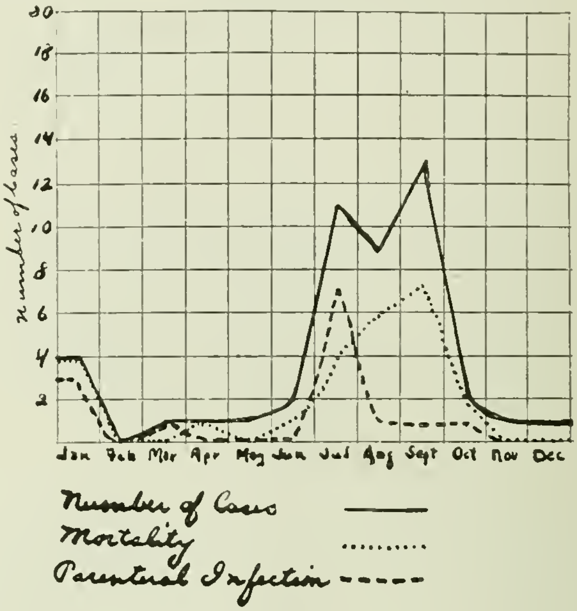


The mortality seemed to depend here on the severity of the enteric infection, the length of time allowed to elapse before treatment was instituted and the general condition of the child and its previous environment more than on any superimposed parenteral infection.

Acute Intestinal Intoxication

There were 46 cases of acute intestinal intoxication in the hospital year 1920, and of these 15 were cured, 4 were removed without showing any improvement and 27 died. A mortality of 58½ per cent. There were none complicated by either nasopharyngitis or bronchitis while in hospital, but 10 cases developed an otitis media and 6 of these or 60 per cent. died. Two cases contracted broncho-pneumonia and both died. Although the mortality was high, the percentage of cases contracting parenteral infection was only 26 per cent.

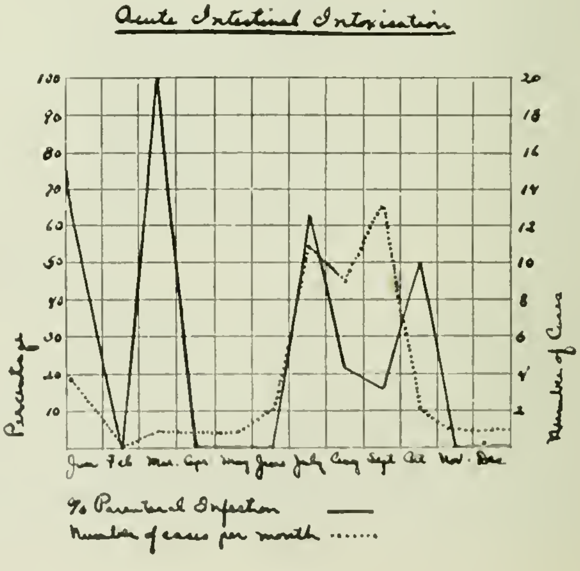
CHART V.



Acute Intestinal Intoxication

The average duration of illness before admission to hospital was 13½ days. The average stay in hospital was 5½ days.

CHART VI.



All of the 9 cases admitted in a moribund condition died, and of the 33 cases admitted acutely ill, 18 or 54 per cent. died. The 4 cases admitted as "not seriously ill" all recovered. Many of the cases were accompanied by either an infectious or a fermentative diarrhœa. For the monthly incidence of cases, mortality and infection, see the accompanying chart. By far the largest number of cases were admitted in the summer months.

While the intervention of a parenteral infection in acute intestinal intoxication certainly made the infant's condition more serious, the mortality seemed to depend rather more on the severity of the intoxication, the age of the child, and more particularly upon the acuteness of the condition before treatment was instituted.

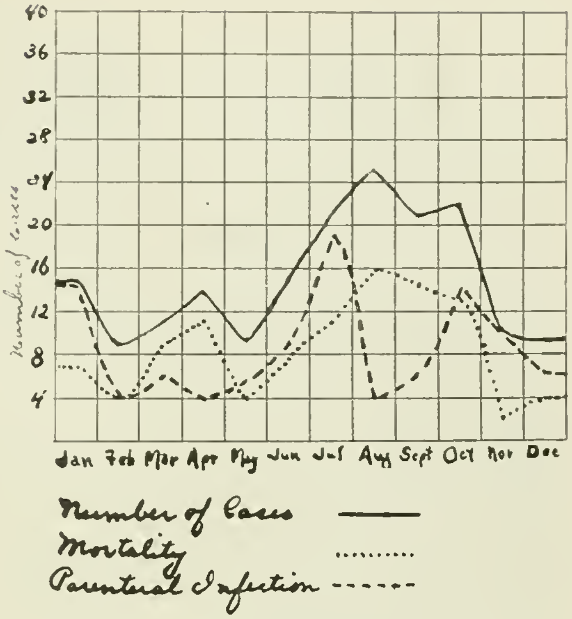
DECOMPOSITION

There were 181 cases of decomposition treated in the hospital year 1920. Of these 56 cases were cured, 18 cases were improved, 3 cases were removed before showing any improvement and 104 cases died. A mortality of 57½ per cent. There were 17 cases complicated by nasopharyngitis or 9 per cent. 49 or 27 per cent. by otitis media. 9 or 5 per cent. by bronchitis and 29 or 16 per cent. by broncho-pneumonia. There were also two cases of lobar pneumonia both of which died. Some had more than one infection. Altogether 37 per cent. developed parenteral infection.

Eleven cases were admitted in a moribund condition, 9, or 82 per cent. of which died. Of the 70 cases admitted as "acutely ill" 54, or 77 per cent. died, and of the 98 cases admitted as "not seriously ill" 41, or 42 per cent. died. The two cases not ill when admitted were both discharged as cured.

In our series of cases, as in the series described by Chappel and Brown, (3) the highest percentage of deaths occurred in the cases of decomposition complicated by a broncho-pneumonia. The next highest mortality occurred in the cases complicated by otitis media. Nasopharyngitis and otitis media were the most common complications. While only 17 cases actually developed a nasopharyngitis in the hospital, probably all the cases having parenteral infection had a nasopharyngitis some time just prior to admittance. (For monthly incidence of cases, mortality and infection, see the accompanying chart.)

CHART VII.



In their article covering 271 feeding cases containing a large number of marasmus patients, Chappel and Brown found the percentage developing parenteral infection was 47½ per cent. as compared to our 37 per cent., and a mortality of 35⅓ per cent. as compared to our mortality of 57½ per cent. However, their series included many simple feeding cases as well as cases of marked decomposition; while the whole of our series of 181 were composed of the latter type of disease.

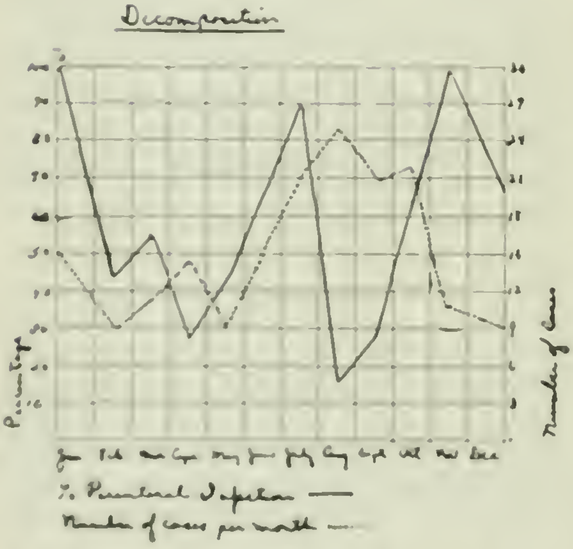
Parenteral infections were far more prevalent in decomposition than in the other three conditions considered and here, as in the other diseases, made the case far more serious, more

DECOMPOSITION

No. of Cases	No.	Mortality	No. of Cases	No.	Mortality
Under 3 months......	64	61 per cent.........	Under 6 lbs.........	46	60 per cent.
3 to 6 months	60	63 " "	6 to 8 lbs.	75	61 " "
6 to 12 months	48	44 " "	8 to 10 lbs.	37	46 " "
Over 12 months......	9	66 " "	Over 10 lbs.........	26	58 " "

	Fermentative Diarrhoea							Infectious Diarrhoea							Acute Intestinal Intoxication							Decomposition						
	No. Cases	Mort. P.C.	Naso Phar.	Otitis Media	Bronchitis	Bron. Pneu.	Per cent Mort.	No. Cases	Mort. P.C.	Naso Phar.	Otitis Media	Bronchitis	Bron. Pneu.	Per cent Mort.	No. Cases	Mort. P.C.	Naso Phar.	Otitis Media	Bronchitis	Bron. Pneu.	Per cent. Mort.	No. Cases	Mort. P.C.	Naso Phar.	Otitis Media	Bronchitis	Bron. Pneu.	Per cent Mort.
Jan.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								4	100		2		1	75	15	46⅔	3	7	0	5	100
Feb.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								0	0						9	44	1	2	0	1	44
Mar.	4	75	[illegible]	[illegible]	[illegible]	1	[illegible]								1	0		1			100	11	82	1	3	0	2	54
Apr.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								1	100						14	78	1	1	1	1	28
May	[illegible]	[illegible]	[illegible]	1	[illegible]	1	[illegible]	2	[illegible]		1			50	1	0						9	44	1	2	1	0	44
June	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	40		1			20	2	50						15	53	0	6	2	2	66⅔
July	[illegible]	24	[illegible]	7	[illegible]	[illegible]	[illegible]	9	22						11	36		5		2	63⅔	21	52	1	11	3	4	90
Aug.	[illegible]	[illegible]	4	10	1	[illegible]	[illegible]	[illegible]	66⅔						9	66⅔		1			11	25	64	0	1	0	3	16
Sept.	[illegible]	[illegible]	[illegible]	4	1	[illegible]	[illegible]	6	[illegible]		2		1	50	13	69		1			7	21	71	1	2	1	2	28½
Oct.	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]	1	0		1			100	2	100				1	50	22	59	5	5	0	4	63
Nov.	[illegible]	[illegible]	[illegible]	4	[illegible]	1	[illegible]								1	0						10	20	2	6	1	3	100
Dec.	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	0								1	0						9	41	1	3	0	2	66
Tot.	[illegible]	71	[illegible]	[illegible]	7	[illegible]		[illegible]	[illegible]	0	5	0	1		46	27	0	10	0	4		181	104	17	49	8	29	

CHART VIII



difficult to treat and the end result more doubtful. Haynes, (4) writing on the prevention of respiratory infections in young infants, made a plea for greater precautions to prevent the spread of these infections and gave various suggestions to this end. A glance at the following chart will show the necessity of these precautions being increased. All who have watched the weight curve of an infant with marasmus gradually ascend after all the usual measures have been instituted, and have seen the fall in weight and the relapse of the patient when a parenteral infection intervenes, know how serious this problem is. Besides the loss in weight, the response to treatment is lessened and the patient becomes the easier prey for subsequent infections. Aside from the question of mortality, these infections are a serious business and a huge obstacle in the path of successful infant feeding.

For the use of these records, I am indebted to Dr. Alan Brown, Physician-in-chief.

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FEAR—A HARMFUL EMOTION, HOW MAY WE ELIMINATE IT FROM THE SURGICAL PATIENT'S MIND?*

Donald Guthrie, M.D.

Surgeon to Robert Packer Hospital, Sayre, Pennsylvania

THE offspring of wild animals at birth are without fear, but this instinct needs only a few days of mother training to be developed to a high degree. Unhappy is the lot of any wild thing who loses its mother during the first few days of life for without the fear instinct developed, it soon falls an easy prey to its many enemies.

Fear, therefore, as a means of protection has been of untold advantage to all species in their development, especially to man, who survived, not alone perhaps because he was fit, but because he knew when to retire and live to fight at another time.

This self-preservation instinct to flee from danger and to avoid painful contact, coming down to man through the ages calls forth immense emotional and muscular activity. The thought or memory of an escape from attack may cause the greatest degree of emotional excitement—so also the apprehending of any oncoming encounter with foe or surgeon may produce the same state of mind and body and even though the individual remain passive during it, his exhaustion will be more complete and more profound than if he had given vent to his emotions in some form of motor activity. It is a well-known fact that fear associated with pain may exhaust the organism to the point of death. Our surgical patients whose minds are racked with these emotions of fear and worry are often exhausted before they are anaesthetized and are fit subjects for surgical shock or death. In no other disease is the relation between fear and the severity and aggravation of symptoms better shown than in exophthalmic goitre. The reduction in the operative mortality in the treatment of this disease has not been due to any improved technique. It has come about since we have had a better understanding of the disease, and of the harmful effects of fright upon these patients. Crile's great work of anoci-association is a monument to his splendid genius!

Cannon has shown that all bodily functions are altered by the emotions of pain, hunger, fear, and rage—fear and rage being the most harmful. The preoperative rise in temperature, the fast pulse, the tremor, the insomnia and at times the glycosuria, are the results of terror which grips the mind of the patient about to be operated upon; often times the subnormal temperature, the lost appetite, the drawn face, and the langour seen in the post-operative patient are caused by grave worry and doubt. It is surprising to see the improvement in these patients as their mental attitudes are changed by suggestion.

Psychoanalysis reveals that much hysteria, psychoneurosis, and many neurasthenic states have as their origin some past emotional upset—usually one attended with fear or fright. We are all familiar with cases showing hysterical paralysis, aphonia, aphasia, or blindness which can be definitely traced back to some terrifying emotion.

Granted, then, that fear is a harmful emotion which may be the foundation of future mental illness, which upsets bodily economy, retards convalescence, interrupts recoveries, and when severe and associated with pain may cause death, is not an earnest effort upon our part to eliminate this emotion from our patient's mind justifiable? What may we do in a practical way to eliminate it? In the first place, the patient should be considered from a psychological standpoint from the time she is admitted until after she leaves the institution. During her entire stay her mental welfare and comfort must receive the same careful consideration as her physical welfare—for the majority of our patients are mentally, as well as physically ill.

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*Read before the Hamilton Medical Society.

The personnel of the hospital should be chosen with great care, and the personality of each worker must suit the position he is to fill. Few of us realize how timid and diffident most of our patients are upon admission, or how easily they may be hurt by apparent inattention or frightened by their new surroundings. It is so important to have their reception a cordial and a friendly one, for the first impressions they get of the hospital and of us are often lasting ones.

The doorman at the hospital, the telephone girls, and the clerks in the office of admission are very important members of the hospital family, for they come in intimate contact with the patient and the public and yet how little thought and care are displayed in choosing individuals for these important positions. Some hotels and hospitals employ only fat doormen and rightly so, for the fat man is usually good natured and cordial and with it all slow to anger. A rasping, shrill, impatient voice of a nervous telephone girl in the office of admission or the cold business-like filling out of a questionnaire by some frigid clerk oftentimes gives the new arrival the wrong impression of the spirit of the institution. Here a little display of cordiality and friendly feeling are by no means lost, for, as mentioned before, our patients are diffident and easily hurt.

Upon admission to the ward, the new arrival should be waited upon promptly by attendants and nurses who have been specially trained and she must be spared seeing, smelling, and hearing things, which are objectionable to her. In other words, she is best admitted to a ward filled with only convalescent patients who are happy and free from pain. If this can be done, the chances are the patient's mind will be robbed of most of its fright and she will be made to feel at home at once. If, on the other hand, she is allowed to sit for a long time without notice or attention, watching those hurry by who have special missions to perform and who are too busy to greet her, she will feel hopelessly alone, or if she is given a bed next to a post-operative case who is groaning with pain or one in the throes of having a gastric lavage, or if she be unfortunate enough to get a couch next to a patient in the typhoid state, it is not difficult to imagine her state of mind or to blame her for wanting to be back home again. The hospital that is equipped with many recovery rooms, small wards, and isolation corridors for the post-operative, the very sick, or those in delirious states is indeed fortunate; for the big ward should be made up of the new arrivals and the comfortable convalescent patients. It is wise not to move our operative cases into the big ward until they are free from pain if it can possibly be avoided. No lavages or painful dressings should be done in the ward, nor should a death be allowed to occur there. The mental peace of the new arrival should have this consideration, for fear injected into her mind at the beginning of her hospital stay is a bad impression if she is to have a comfortable and a quick convalescence.

It is not right to have operations delayed for an unnecessarily long time if there is nothing about the patient's case that justifies delay. The surgeon or his associate should visit the patient the night before the operation. At this time the patient is assured that her malady is curable; the operation is indicated and that her physical condition has been found to be perfectly satisfactory. If possible, she should be allowed to talk with convalescent patients who have had similar operations and who have had quick and comfortable recoveries. This will do more to encourage her than we realize. The spirit to win is half the battle in all games of life, and the patient who feels or can be made to feel certain that she is going to come through a surgical ordeal generally does get well. On the other hand, the patient who is convinced he is going to die before his operation, who doubts what he is told about his operation, and who fears that everything is being misrepresented to him, generally does die or have the most stormy sort of a convalescence (I say "he" very advisedly).

The night or nights before operation must be spent in sound, restful sleep. Our patients should not be dehydrated by pre-operative purges and their rest broken by numerous trips to the bathroom. Most surgeons have discarded the castor oil or saline purge, and now rely upon the mildest laxatives or enemas, and rightly so, for our surgical patients need rest and fluids immediately before operation.

Our operations should be scheduled as early as possible to spare our patients the dreaded wait, the annoying thirst and the prostration from hunger. If for any reason the operation cannot be performed until late in the morning or in the afternoon, we do not hesitate to give our patients warm fluids as coffee, tea, and broths.

The subject of the anaesthetist and the anaesthetic are extremely important and vital if our patients are to be spared fear and fright. The treatment of the exophthalmic goiter patient by Crile's anoci-association has been purposely left out of this discussion because it is so refined and so complicated. Any surgeon, however, who is able to successfully employ the technique of anoci-association to his goiter patients can be justly proud of his anaesthetists and his organization, and can take satisfaction in his ability to perfect such an organization. The anaesthetist must be a skilled psychologist and have a personality which can readily apply different kinds of suggestion to different individuals. At the beginning of any anaesthetic—chloroform, ether, nitrous oxid—a mixture of eight parts of suggestion and two parts anaesthetic is the best one known. If the fears of the patient can quickly be allayed by a constant stream of suggestion, she will no doubt go to sleep quietly and recover from the anaesthetic in the same state of mind. The older text books of surgery show cuts illustrating the stage of excitement during anaesthesia. The services of five or six of the strongest helpers in the hospital were enlisted to control the patient during this period. These terror stricken individuals invariably woke up in just the frame of mind in which they went to sleep—kicking, struggling, screaming, and trying to flee from something horrible. Is it any wonder that these frightened, starved, dehydrated, strychnine-lashed patients had anything but a horror of our hospitals? The writer may be wrong in his belief that the subconscious mind goes to sleep last and is the first to recover in anaesthesia, but there is much evidence to support it.

The question as to whether our patients had better come to the operating room for anaesthesia or be anaesthetized in special rooms is a much debated one. (Here again the exophthalmic goiter case is not considered). If the case can be accompanied from her room or ward by the anaesthetist and welcomed by a friendly group in the operating room where no instruments are in sight, her attention undoubtedly will be so attracted by what is being said to her that her fright, if she has had any, will be forgotten If, however, she fears the operating room she is anaesthetized in a special room. During the anaesthesia she is left entirely with the anaesthetist. She must never hear the rattling of instruments, and it is well to train the operating team to keep their peace while the anaesthetic is being administered. Witticisms and laughter are best tabooed, for it is serious business to the patient, this being operated upon, and she does not want her case considered in a light-hearted way. Equally important, a discussion of her case is not wise, for she may be able to hear even though she cannot talk, and be badly frightened by having certain details of her case discussed which have not been gone over with her. The writer knows of an instance where the surgeon, believing the patient to be asleep said to his assistant: "We will first explore the gall bladder, and if we don't find the stone we will turn him over and look at the kidney." "No", said the patient, who was not asleep, "some other surgeon who knows what he is going to find shall operate upon me.!"

The anaesthetist is the most valuable member of the operating team, and if properly trained and with the right personality, can do more to rob the surgical patient's mind of fear than any one else.

Can anyone witness the successful anaesthetizing of young children and see child after child put to sleep without crying, without struggling, without fright, and not admire the great skill that is being shown in suggestion and hypnotism; and, after seeing a screaming, struggling child asphyxiated by a poor anaesthetist, who of us is in the position to say just how much or of what type of future mental ill health may have its origin in the fright caused by this bad anaesthesia?

It is important to have the patient recover quietly from the anaesthetic in a recovery room. She must be administered to by a nurse who has been specially trained and who will assure her that the operation has been successfully performed and that her condition is excellent. Quiet, calm assurance at this time that everything is as it should be works better than sedatives, although it is essential that immediate post-operative suffering be controlled by morphine. We give frequent small doses of morphine for the first two days, and large amounts of fluids by mouth and rectum soon after operation. Everything possible is done for the comfort of these patients. After operation nurses are with them constantly and they have frequent visits from the surgical staff. The apprehensive patient who is allowed to suffer cannot be convinced that her condition is satisfactory—it is far from being so to her—and she fears an unsatisfactory or fatal outcome. The services of a corps of efficient, loyal, well-trained nurses, who love their work and who look upon it as an art and not a trade, at this time are indispensable.

The convalescent period of the successful surgical patient is short and certain. If there is good morale in the hospital, and in the ward particularly, the patient will be carried along on the tide of optimism and a feeling of security. The surgeon must come in close contact with his patients for he knows that he need not be feared in order to get his full quota of respect. Too much etiquette and ceremony during rounds do not encourage the friendly association that the chief ought to have with his convalescent patients.

All surgical patients must be examined by the surgeon or his associate when they are ready to leave the hospital. At this time the patient's disease or operation should be explained to her in detail, all final instructions for her after-care should be carefully given her, besides telling her that her home physician will be written to about her case. This gives her a sense of security at home and the request that she write back a report of herself from time to time is met with delight, for she feels that the interest shown in her will not come to an end when she leaves.

The surgeon cannot rely upon his operating skill alone for his full measure of success for it is necessary to give himself freely to his patients at all times. They need to be comforted, assured, and bolstered up for the trying ordeals they are about to undergo. The surgeon's optimism must be contagious—his coworkers must all be infected by it and his organization trained in practical psychology if the patient's mind is to be freed from the harmful emotions of fear, apprehension, doubt, and worry.

Little touches of human kindness—strict and constant attention to the patient's mental welfare will do much to rob our hospitals of their cold institutional atmospheres, which frighten so many of our diffident patients, and often interfere with many a satisfactory recovery.

X-Ray Diagnosis after Pelvic Inflation.—Van Zwaluwenburg, in a paper published posthumously (*Journ. of Radiology,* March, 1922), states that, apart from the demonstration of the patency of the tubes in sterility, the most valuable contribution of gaseous pelvic inflation (followed by X-ray examination) to gynæcological diagnosis consists in the exclusion of organic lesions in young subjects suffering from dysmenorrhœa and neuroses: the method is singularly successful in the detection of slight changes in the morphology and relationships of the pelvic organs, and it is fairly safe to conclude that the pelvis which appears normal after use of the method in question, is in fact without significant pathology and does not require operative exploration. For X-ray examination of the pelvis inflated with the gas the writer suggests the name "pelycography": pelycography, he says, will usually permit the diagnosis of pregnancy after the sixth week; it may lead to the exclusion of ectopic pregnancy, but owing to the early appearance of secondary changes is of little assistance in establishing such a condition. Van Zwaluwenburg has used this method in 350 cases without untoward result. It appears that in America 3,000 to 4,000 patients have been subjected to this method of examination with five recorded fatalities, of which one was due to puncture of the spleen and another occurred in a septic case. It is said that after gaseous inflation of the peritoneal cavity distinction between renal and splenic tumours by X-ray examination is particularly facilitated.—*Brit. Med. Jour.,* April 22nd 1922.

THE VALUE OF THE WASSERMANN*

F. T. Cadham, M.D.

Winnipeg

IT is some fifteen years since the Wassermann test was discovered. Its use is now world-wide. Laboratories are to-day carrying out ten times as many such tests as they were a few years ago. The value of the test has become of wide-spread interest to the physician, the patient, and the public.

This value is to-day a much discussed subject, both by the qualified and the unqualified. Let us consider for a moment the reasons which give rise to any question of its value. First; its value to the physician. Ever is it the wish of the physician to have medicine an exact science. A test of the blood is discovered which may indicate that the patient has syphilis. The physician sends a specimen of blood to the laboratory and desires that a positive or negativ report settle the question of syphilis as far as that patient is concerned.

Unfortunately, this is just what the laboratory can not do, and may I state this principle now—a principle we must carry in our mind during the discussion of this value:—the Wassermann test, like practically all other laboratory tests, is only a symptom of a disease, the finding to be used by the physician in correlation with all other symptoms in his judgment of the case. It is, however, the province of the physician to know the value of this one symptom for the report has a far reaching significance in all its phases.

What is this value? The investigations of many able workers, with exact technique and with close relationship between the laboratory and the clinical case, show that untreated, definite clinical cases of syphilis give a positive Wassermann as follows:—

In primary syphilis, 30% at end of first week up to 80% in the fifth week. (1) In secondary syphilis, 96 to 100%. I have never seen an untreated case of syphilis with a rash or mucous patches in the mouth that did not give a positive Wassermann. However, negative results have been reported in a few cases of malignant syphilis. In tertiary syphilis, 85 to 90% of cases show a positive reaction. In congenital syphilis, 100% at birth, decreasing to 85% in adult life. The cerebro-spinal fluid does not show as high a percentage; even in the presence of neuro-syphilis only 60% of the cerebro-spinal fluid is found positive.

The relation of the positive test in the blood to the clinical case is then indeed one of great accuracy and high value. (2) (3). Does then a positive test indicate only syphilis? Numerous investigators, with varied technique, have claimed that positive reactions were obtained in tuberculosis, scarlatina and in fact, in nearly every known disease of the human race. Extensive work, however, by painstaking investigators shows that these conditions do not give a positive Wassermann, and that there is little or no reaction in any disease, with the possible exception of yaws and leprosy, and sometimes in blood collected at the height of a febrile attack. In this connection it is well to note that according to able syphilographers, from 5 to 8% of our population is syphilitic. Now syphilitics may and do have other diseases—scarlatina, tuberculosis, skin or mental diseases—the dominant symptoms are of these diseases, and such patients may and do have positive Wassermanns. To recognize these conditions is the duty of the clinician.

After a personal experience of a dozen of years with Wassermann tests, in which I have had the opportunity to see many of the patients, I am impressed on the one hand with its clinical accuracy and on the other with its numerous pitfalls. It is because of the latter that there is a difficulty in judging the true value of the test, and these pitfalls have subjected the test to extensive criticism.

I shall discuss these as briefly as possible, without going into the complicated technique of the reaction, under the following heads.

1.—Variations in the patient.

2.—Collection of the specimen.

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*Read before the Winnipeg Medical Society, December 21st, 1921.

3.—The report and its interpretation.
4.—The technique of the laboratory.

First—Variations in the Patient

Using the same technique and reagents, some patient's serum varies in its reaction from week to week. Syphilis may vary in its symptoms from week to week with and without treatment; the Wassermann test may follow these periods of the disease.

Blood taken at the height of a febrile attack may give a slight positive reaction (4); also blood taken during anesthesia. It is also claimed by some observers (5) that the injection of salvarsan will produce a positive reaction in 30% of normal individuals. Alcohol has the opposite effect; in 20% of positive cases 24 hours after taking alcohol they become negative This does not apply to gin. (6)

Second—The Collection of the Specimen

Herein is a great source of error. I consider that 15% of the specimens we receive in our laboratory will not give accurate results. The reasons are that the specimens have been infected with bacteria and chemicals, or are hemolyzed. The Wassermann reaction is exceedingly sensitive, the slightest trace of any chemical is often sufficient to change the result. Bacteria, water, and infected glassware affect the reaction. Hemolysis is sometimes caused by taking the blood with a syringe; excessive force in drawing and expelling the blood injures the corpuscles. Freezing and shaking cause hemolysis. Messenger boys have the habit of bringing in a specimen on the front of a bicycle; in winter they arrive frozen; in summer hemolyzed. We receive Wassermanns in a variety of containers, infected, hemolyzed and frozen; with cotton plugs which have absorbed the serum, or corks impregnated with chemicals. Blood should be collected in a sterile container such as a Keidel tube, sloped and set aside immediately to clot; after clotting it is correctly labelled, and placed in the icechest. The serum is then removed within 12 hours. The labelling gives rise to a frequent error; it is a clerical error. Some institutions and physicians send in specimens numbered; the number corresponding to a name; numbering and labelling the specimen is often left in the hands of clerks and technicians. Specimens are collected in groups; all bloods look alike, and it is but a specimen of blood. Do physicians consider the correct collection, labelling, and transmission of a specimen of blood for the Wassermann test seriously enough?

Third—The Report

Most laboratories adopt the method of Citron, namely, negative, doubtful, one, two, three, and four plus positive. These degrees depend upon the amount of complement fixed, as judged by each individual observer. Some laboratories also report the reaction as obtained with the different antigens, such as cholestrinized, acetone, etc. The physician to-day has enough knowledge to assimilate without being forced to judge the value of these reagents, surely the laboratory should be the best judge of the value of its own antigens, and so report the test positive or negative to the general practitioner. No two antigens are alike and any laboratory is able to prepare antigen so sensitive as to pick up many false positives. Such a complicated method of reporting may arise from tests being carried out by technicians unacquainted with the relation of that particular reaction to the clinical case: or may be rightly used by the laboratory, the reports of which are only received by the specialist.

The Interpretation of the Report

A negative report means:—1.—That the patient never had syphilis. 2.—Is serologically negative after treatment. 3.—That the case is latent. 4.—Because of some peculiarity in the elaboration of antibodies, the test fails to be positive. A doubtful reaction is one in which there is from 10 to 15% inhibition of complement. Such reactions frequently follow treatment; they are also to be found in the early stage of the disease, and are sometimes due to imperfection in the specimen or the technique. For diagnosis, such reaction calls for further tests. A one plus positive is a reaction which is 25% positive. This reaction also occurs frequently during treatment and in the primary period of the disease. The physician should consider such a finding with caution and repeat the test if doubtful of other symptoms. A two plus Wassermann is 50% positive; a three plus 75%; and a four plus 100% positive. With assured technique such reactions in this country are indicative of syphilis. In latent syphilis the reaction of the cerebro-spinal fluid is sometimes positive when the blood is negative. It is to be noted that in every stage of syphilis there are a few cases which will not respond to the Wassermann test in the presence of clinical symptoms. A negative test then does not absolutely exclude syphilis.

The Value of the Test in Treatment

In over 90% of the cases treatment changes the reaction from positive to negative. However, there is now abundant evidence to show that the test may again become positive after a period of rest. It is safe to assume, therefore, that a negative test fairly early after treatment indicates inactivity rather than cure.

Again, after most intensive treatment about 10% of the patients remain so-called "Wassermann fast cases"—the Wassermann remains positive. We have tested in our laboratory one patient's serum 32 times over a period of several years, and it has always remained fully positive. This condition is an indication for careful clinical investigation. (7)

In some cases of clinical syphilis with a negative Wassermann, the Wassermann has become positive after an injection of salvarsan. This gives rise to the so-called provocative Wassermann reaction (8); a reaction that must be held in doubt until further proof is obtained as to the effect of salvarsan on normal individuals. (9)

In considering the reaction as a criterion of cure, caution must be observed. A negative reaction does not necessarily indicate a cure although it is an indication of the effect of treatment. Certainly clinical symptoms do not progress with a steadily decreasing positive Wassermann. Some persons receive and use a negative report as a certificate for a life time. Such persons may have syphilis; may have been treated, and may have manifestations return later; or such persons may subsequently contract the disease.

On the other hand, a persistently positive Wassermann can hardly be considered to indicate persistent drastic treatment (10) (11); the future alone will show what a persistent Wassermann means as to prognosis. It is wise for any syphilitic patient to have examinations repeated every six months for a period extending over years. Prolonged observation, clinical and serologic, supplies the test indicative of a cure, and a cure can at present be construed only as the absence of those symptoms detectable at the time to the physician's senses. (12)

What is the value of the test in answering that difficult question, may the patient marry? One would indeed hesitate to advise 'yes' to such a person if the test remained positive; only may marriage be permitted when the Wassermann is found negative over a prolonged period, and there is a complete absence of clinical symptoms.

The Technique of the Test

It is not my purpose here to burden you with all the ramifications of the technique of the test. In spite of modifications the classical Wassermann at present remains as the most widely used diagnostic laboratory test of syphilis. It is a biological test, and the reasons for the reaction are only partly understood. If carried out accurately it is the most complicated and difficult of all laboratory work, requiring constant supervision, and when left in the hands of a technician whose observation is limited to the test tube, it loses its value. There is at present no standard method of performing it, although extensive investigations along this line are being carried out. (13) The best standardization that exists to-day is the length of experience of any one observer with a certain technique, checked by clinical observation. Reactions vary with the amboceptors, serums, complement, time and method of incubation and the antigens. (14). I have found it necessary to select the latter with great care. A heart selected for antigen from a man or animal suffering from tuberculosis or other disease will sometimes give a slight reaction to the blood of persons suffering from these diseases; in other words a false positive.

I have endeavoured to give the individual value and pitfalls of the test as briefly as possible. Some of these pitfalls are avoidable; others are not. A higher perfection of technique and a better understanding on the part of the physician will enhance the value of the test.

A word as to the general value. The Wassermann test, more than any other feature has focused the attention of the world on syphilis. We may now for the first time look for the check and the possible elimination of this, the most wide-spread and insidious of all diseases. It is now used by the state in jails, detention homes, and such institutions, and serves as a lever to insist on the treatment of those cases that do most to spread the disease. The great difficulty in any former attempt to control the disease was to locate and treat those most responsible for its spread. Recently Professor Williams (15) of Johns Hopkins, carried out a series of 4,577 tests on pregnant women admitted to the hospital, 421 gave a positive Wassermann. In those receiving satisfactory treatment the results were remarkable compared to the untreated cases. If that is the result in one hospital, what may be done over the world? The test was used in our army to check the cases before return to civil life; those cases with a positive test were treated, and treated excellently; without this test they would have been discharged and become a menace to the population. If prevention is our ideal, then indeed the Wassermann test is of high value.

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THE EFFECTS OF GENERAL ANAESTHETICS ON THE LIVER

C. La Rocque, M.D.

Montreal

History

It was only a few years after the discovery of ether and chloroform that death was noted to take place after a general anæsthetic had been administered. In fact, it was in 1850 that Casper published cases of death occurring several days after the narcosis and the same year, Von Langenback reported a case of death after seventeen hours, and discovered that the liver was filled with fat. It has been an established fact, therefore, for as long as anæsthetics have been used, that accidents will occur at a more or less distant interval after anæsthesia, and also that there is some relation to the hepatic lesions found.

Nothnagel, Ungar and Junkers have proved by experiments the importance of the hepatic steatose. Paul Bert in 1885 found the same lesions and also discovered pigments of bile and urobilin in the urine. Later, Thum, Fisher, Chiarleoni, and Cohn describe serious forms of "icterus post anæsthetic," while De Bovis in 1903 makes mention of a mild form of the same icterus. Bastianelli in 1891, Frænkel in 1892, Bauder in 1896 and Aubertin in 1906 studied the histology of these same lesions.

Since that time, Aubertin, Quenu, Chevrier, Brule and Benard have made known certain points of the clinical history of the post-anæsthetic icterus.

Pathological Anatomy

The anatomical lesions of the chloroformed liver are now very well known and have been demonstrated by animal experimentation. It is true that the lesions thus discovered are not always in proportion to the duration of narcosis. For instance, Aubertin, after having chloroformed a rabbit for half an hour during thirteen consecutive days, could ascertain but very minimal lesions such as congestion with considerable enlargement of the capillaries, especially around the central vein, and a very slight, barely perceptible infiltration of fat. On the other hand, animals dead from two to four days after anæsthesia without having presented any symptoms of icterus and after only a single anæsthesia, showed a general degeneration, hæmorrhages, steatosis and occasionally a total necrosis of the liver.

Serious cases of icterus leading to death of human beings, showed lesions varying from the first stage of fatty degeneration to that of complete cell necrosis.

Fiessinger and Montaz detail a case in which the autopsy revealed a nutmeg-like liver and in which the lesions consisted of an intense degeneration of the whole of the centre of the lobules; the hepatic cells had nearly disappeared and there was pronounced fatty degeneration around the spaces of Kiernan.

CLINICAL STUDY—CHLOROFORM

Benard notes three different forms of this affection; (a) the serious; (b) the mild; (c) the form without clinical symptoms.

(a) The serious form is recognized as appearing in two different forms; the nervous type and the serious icteric type:

1.—The nervous, in which the predominating symptoms are convulsions and delirium, differing considerably in degree of intensity; vomiting is early, violent and frequent. Micturition is infrequent, the urine dark and containing pigments of bile, urobilin and albumen. Death may result from the third to the seventh day.

2.—The serious icteric type is characterized by the early appearance of jaundice which dominates the whole case. The nervous symptoms appear only towards the end.

(b) The mild form is distinguished from the foregoing by its symptoms being much less serious, and by its resolution within a few days.

(c) The third form known by the French, as the "forme fruste" is that in which the clinical course is reduced to a minimum. The patient has no pains nor trouble, displays no coloring of the teguments. On the contrary a study of the blood, by its colour and by a study of the pigments, enabled Benard, Chevrier and Sorrel to establish the following laws:

1.—The cholæmia is constant.—It is found in 93 cases out of 93 anæsthesias. All subjects chloroformed become cholæmic and the icterus whether mild or strong is only a more accentuated modification of a constant phenomenon.

2.—This cholæmia is immediate.—It starts even during the operation and attains to a high degree as early as eight hours after the start of anæsthesia.

3.—It is cyclical.—It increases during the first thirty-six hours and reaches its maximum during the second day to disappear little by little, lasting at times from eight to eleven days.

ETHER

There is no clinical history of a case of hepatic lesions caused by ether. It is probably on this account, that a number of authors for a long time were convinced that ether had no noticeable effect on the liver.

In 1910, Rathery and Saison ascertained by experiments that hepatic and renal lesions produced by the use of ether were as frequent and probably as severe as those caused by chloroform. The histological lesions are analogous, with, in addition, hæmorrhagic lesions, of very pronounced character. Brule, Garban and Le Gal LaSalle have found hepatic troubles just as frequently with ether as with chloroform.

In 1919, Chevrier published statistics of 38 cases of cholæmia in 38 cases of anæsthesia with ether. On the other hand, Brule and his associates report that on 15 anæsthesias with chloroform, in 12 cases there was a severe retention of bilious elements, in 2 cases, a mild retention and but a single instance where there was no retention, also that out of 33 anæsthesias with ether, there had been 22 severe retentions—6 mild and 5 void. Therefore they concluded that ether did not seem much less poisonous than chloroform for the liver. Making a comparison of the cholæmia of ether with that of chloroform, Chevrier noted slight differences, particularly the quicker action of ether and its shorter duration.

NITROUS OXIDE

Since nitrous oxide has been in current use only a few years, it has not as yet afforded occasion for many experimental or scientific researches.

Following the experiments of Chevrier on the action of ether and chloroform on the liver, we have made the same tests to determine the effects of nitrous oxide on the liver.

We have systematically looked for the presence of urobilin and bilious pigments in a series of patients before surgical interference, as well as on the second and fifth days after surgical intervention. This series of patients was put into two different classes, one in which the anæsthesia caused by nitrous oxide had been sufficient to allow for surgical work and the other those in which it had been necessary to make use of a small quantity of ether.

In the first group of these patients, approximately eighty per cent. of the cases showed no traces of urobilin and where there were slight signs of it. it had completely disappeared within forty-eight hours; twenty per cent. only, retained any traces of it for more than five days. As to the biliary salts only twenty per cent. displayed any traces of same, this however, had totally disappeared after forty-eight hours.

In the second class of these patients, transient urobilin was noted in only twenty per cent. of the cases. As to biliary pigments, these were found only in the same proportion.

At the same time that we were making these researches. Desmarais and Lascombes, in France, were doing the same there, and got results which were more than ever in favour of anæsthesia with nitrous oxide. In no case did they discover, after anæsthesia with nitrous oxide, the presence of urobilin or biliary pigments in the urine of their patients. It must be noted, however, that the patients on whom they experimented, had been subjected to no surgical intervention, whatever. The anæsthetic had been used in these cases, either to permit of a too painful examination or of the application of a plaster cast.

It is important to note this point, since cholæmia may also be produced by the operation, as we will have occasion to see when studying the pathogenesis of the effects of general anæsthetics on the liver.

Pathogenesis

Following these researches, it would appear that the pathogenesis of the post-anæsthetic icterus would be simple. It would seem to be only a matter of the intoxication of the hepatic cell and consequently an icterus of hepatic origin. However, this question has given rise to discussions. Quenu and Kuss were the first to submit the hypothesis of a hematogenous icterus, by concluding for instance, that chloroform which is poisonous in vitro to the red corpuscles could also determine "laking" in the blood circulation. Gilbert, Chabrol, Weill have also been of this opinion.

Benard disagreed with this way of thinking. In studying the globular resistance to the saline solutions in cases of cholæmia, after chloroform, without icterus, he observed two different reactions of the cells, hyporesistance and hyperresistance. When hyporesistance manifested itself, it came as early as the first day, to become normal again on the fourth day, while in cases of hyperresistance, appearing later, it would not reach its maximum before the fifth or seventh day. The absence of granular degeneration in red cells, when considering the severe and transitory character of the hyporesistance, could easily make him doubt the possibility of an icterus of hæmatogenous origin. The later researches of Brule, proved the logic of Benard's theory. The frequent retentions, more or less severe, of pigments and biliary salts, prove that if icterus of hæmatogenous origin existed, it was in exceptional cases.

However, Quenu, Duval and Brule, also explained this hyporesistance of the red cells in the following manner: All operations, they said, were accompanied by effusions of blood in the system, therefore the re-absorption of the blood can determine a local hæmo-biligenic process, resulting in cholæmia. It is to a similar phenomenon, that we must attribute a consecutive icterus in a case of radical cure of hernia performed by Reclus with a local anæsthetic.

Through what mechanism are general anæsthetics poisonous to the liver? Evarts A. Graham attributes it to a certain dose of asphyxia, which is produced by a lessening of oxidation and by acid intoxication. If chloroform is more poisonous than other anæsthetics it is on account of its decomposition into hydrochloric acid which increases the acid intoxication, hence fatty degeneration of the hepatic cells, necrosis and hæmorrhagic processes. On the other hand, Davis and Whipple, after their experiments cannot attribute the poisons in anæsthetics to asphyxia of the tissues and have in no case noticed the protection afforded by alkalines.

Conclusions

1.—The use of ether and chloroform produce a cholæmia of same length and to the same degree.

2.—Nitrous oxide used on patients requiring no surgical intervention, produces no cholæmia and is the only anæsthetic which does not injure the hepatic cell.

3.—Nitrous oxide reduces considerably the frequence, length and intensity of the cholæmia in persons who were operated upon.

4.—Administered together with ether, nitrous oxide and oxygen reduce considerably the cholæmia and the length of same, when compared with the effects of ether alone.

5.—According to Desmarest and Lascombes, knowing that anæsthesia produced by nitrous oxide and oxygen alone cannot modify the degree and frequency of cholæmia, it is possible to establish the place that the traumatism of the operation takes and they even go as far as to say that if the post-anæsthetic cholæmia is nil, the post-operative cholæmia is all the more severe according to the nature of the traumatism produced by the operation.

6.—Nitrous oxide and oxygen is therefore the anæsthetic to be used on all persons who have hepatic lesions, in cases of intervention on the biliary tract and on patients whose general condition is seriously affected.

TREATMENT

It is evident that there is nothing particular about the treatment, it is the ordinary treatment for toxic icterus, according to symptoms. It is to prophylactic means that we must resort.

But how can we prevent, at the time, the very noticeable action that anæsthetics have on the liver, or at least how can we limit these effects?

The choice of the anæsthetic is the most important point, in prophylactic treatment. Since nitrous oxide and oxygen has no effect, or hardly any, on the liver, we should therefore use this anæsthetic as often as it is possible to do so.

Davis and Whipple have proved that fasting and fats favour chloroform intoxication. On the other hand, they found that sugar, carbohydrates, skimmed milk, and casein are good preventatives thereof.

Certain chemical agents also have properties which enable the system to make use of its own powers of resistance. For instance, quinine and adrenalin in causing an increase of glycogen have good results. Chevrier, in France, also determined that cholæmia is considerably lessened if the patient is given on the previous day or even on the morning of the operation, 150 grams of syrup of sugar. The effects of this sugar are rendered more beneficial, if after the operation a glucose injection is given. He also found that liver extracts administered the day before, produced satisfactory results. Consequently, the combination of the two systems, that of sugar and the hepatic opotherapy may lead to the disappearance of cholæmia.

Before closing, it would be well to call to your attention the fact that we are doing away more and more with long fasts and strong laxatives. These innovations, although of recent date, have already been of great help in the struggle against unsatisfactory effects which general anæsthetics have on the liver.

Function of the Colostrum.—The blood of new-born infants, and probably of all other mammals, contains little or none of the serum protein or protein fraction known as the euglobulin. This seems to be supplied chiefly by the colostrum, which differs from milk in containing a large amount of this protein secreted directly from the blood. The euglobulin is the only blood protein that appears in the colostrum, and it is the only protein fraction in which the new-born infants' blood is deficient. It is suggested by JULIAN H. LEWIS and H. GIDEON WELLS, Chicago, evidently the colostrum is formed to provide the fetus with a supply of euglobulin for its blood, during the short period immediately after birth, when proteins may be best absorbed without disintegration by digestive protelysis. The importance of this lies in the fact that the protective antibodies of the blood are found associated with the euglobulin fraction, and that the quantity of protective antibodies found in the colostrum, the milk and the infant's blood varies directly with the euglobulin content of these fluids. Evidently the colostrum furnishes to the new-born mammal protective antibodies, which probably add much to its capacity to resist infection in early life. If the infant does not receive colostrum it requires euglobulin in its blood much more slowly, and presumably is in corresponding degree less resistant to infection. It is not probable that there is any equivalent substitute for human colostrum for new-born infants. The findings of numerous recent workers reviewed by Lewis and Wells add force to the statements made by Famulener, ten years ago, that it is most highly desirable that every new-born infant should receive its full ration of human colostrum.—*Jour. A. M. A.*, March 25, 1922.

REPORT OF A CASE OF BROMIDE ERUPTION IN A NURSING INFANT[*]

Frank H. Boone, M.B.

Late Assistant Resident, Hospital for Sick Children

Toronto

We have known for some time that certain drugs given to a nursing mother are excreted in the breast milk, though usually in such small quantities that there is no effect on the baby; we fail to realize, however, that certain drugs, principally bromide and diarsenol preparations may be excreted in sufficient quantities to poison the infant. Such cases come to light from time to time.

Dunn believes that some drugs are excreted in breast milk but not in sufficient quantities to do harm. Salvarsan, however, may be excreted in quantities large enough to cause death of infant.

Grulee (2) says that given in physiological doses very few drugs are excreted in the breast milk, but given in poisonous doses many are.

Garrod, Batten and Thursfield (3) believe that drugs taken by nursing mothers may be partly excreted in the milk and may affect the child.

Morse and Talbot (4) say that some drugs are excreted in the breast milk, but only in traces.

Chapin and Pisek (5) believe great care must be taken in giving drugs to nursing mothers as they may be excreted in the breast milk.

Holt (6) mentions the elimination of drugs in breast milk and says that few of those popularly supposed to affect the child through the mother do so, but states that iodides and bromides are excreted in sufficient quantities to produce their constitutional effects in the child.

Still (7) speaks of the excretion of drugs in the breast milk and the possibility of making the breast milk disagreeable to the child, and says that the less drugs a nursing mother takes the safer for the child.

Report of Case

C. W.—Age, 6 months. Admitted to wards of the Hospital for Sick Children, March 22, 1921.

Complaint—Eruption, 3 weeks.

Family History—Mother nervous, rundown. Had been taking following tonic for 7½ weeks.

Sodii bromide—6 drams.
Liq. Ferri Cum Quininax.
Liq. Ferri Cum Quininax et Strychnina ad 8 ounces 2 drams. T.I.D. P.C.

Feeding History—Nursed since birth.

Previous illness—None.

Present Illness.—Three weeks previous to admission, mother had noticed two or three pustules on cheek and head. They had rapidly increased in number and appeared on buttocks and legs. They were never itchy and child's general health appeared good.

Examination.—Well developed well nourished, male child of about six months of age, who did not appear ill or irritable.

Skin: There was an eruption present on face, scalp, buttocks and legs.

Lesions were raised, crusted, squamous and granulomatous.

Patches varied in size from 1 to 2 cms. with well defined margins and an area of erythema around them. A few larger patches showed secondary pustules. These pustules on pressure exuded a sero-purulent discharge.

Other systems appeared normal.

Clinical Laboratory Findings

Urine, Negative. R.B.C. 6,400,000. Haem. 100 percent
W.B.C. 14,200 Polys. 38 percent
Lymph. 60 percent
Eos. 2 percent

Wassermann—Negative.
Tuberculin tests—2
Intracutaneous—Negative
Von Pirquet—Negative
Treatment—Mother's tonic discontinued.

Progress.—Eruption underwent a gradual disappearance. In about two weeks time pustules had disappeared and crusts were commencing to separate. Child was discharged to return to Out-patient Department where he was kept under observation. He continued to improve and six weeks after mother's tonic was discontinued all the crusts had separated.

Discussion.—In this case we have a nursing baby six months of age, receiving sufficient bromides through the mother's milk to produce marked cutaneous signs of bromide poisoning. The mother was receiving forty-five grains of sodium bromide per day, over a period of seven and a half weeks. Not until four and a half weeks after bromides were started did the first symptoms of intolerance appear in the baby.

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[*] From the wards of the Hospital for Sick Children, Toronto, Ontario, July, 1921.

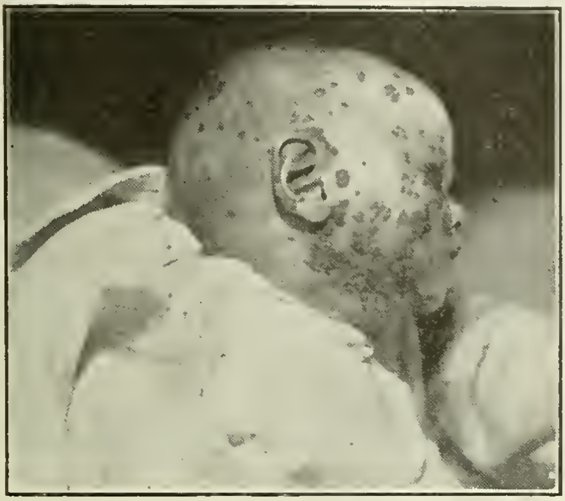

Fig. 1.—Showing distribution and character of eruption face and head.

The mother never developed any eruption.

When the tonic was discontinued, the baby's condition showed a steady but gradual improvement.

Van der Bogert (8) reports a case of bromide poisoning from mother's milk following the use by the mother of a tonic which contained ammonium bromide 1.13 percent, potassium bromide 9.87 percent, sodium bromide 6.93 percent.

Stelwagon (9) mentions appearance of bromide eruption in nursing babies where mother has been taking bromides, even where mother is free from an eruption. He states that the eruption persists for several weeks after the drug is discontinued.

Sequeira (10) observed bromide eruption in nursing infants, following use of bromides by mother. He noted that when eruption first appeared it resembled varicella, but that pustules did not dry up but ran together forming confluent patches which increased in size and ultimately suppurated. He states that the characteristic lesions are flat, slightly elevated with brownish crusts and a zone of erythema.

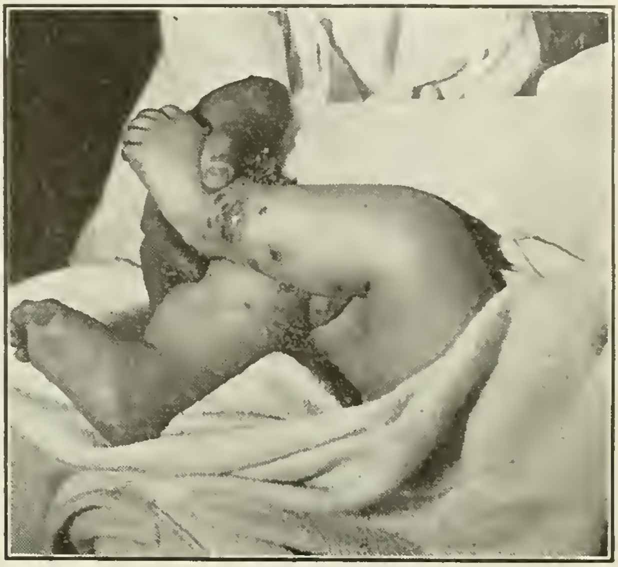

Fig. 2.—Showing distribution and character of eruption on legs

I am indebted to Dr. Alan Brown, Physician-in-chief for permission to report this case.

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Foreign Hospitals

THE PARIS MEDICAL SCHOOL

Its Hospitals
The Medical Curriculum
Post-Graduate Work

E. St. Jacques,

Professor Clinical Surgery, Univesity of Montreal

What are the clinical facilities offered for post graduate work in Paris, and what are the special features, if any, of the Paris Medical School? Such are the questions I have been asked to answer for the readers of the *Canadian Medical Journal*. The questions are timely, since travelling facilities are becoming normal in the Allied Countries, and Paris, as well as London and Edinburgh, offers ample and varied opportunities for practical post-graduate work. These lines will be supplementary to the excellent notes given in the January number of our *Journal* by Dr. G. R. D. Farmer and will bear on : A. The Hospitals and their staff. B. The Medical Curriculum. C. Post-Graduate work.

I.—Hospitals and Staffs

The 35 and more public hospitals of Paris all belong to the municipality, which is solely responsible for their upkeep as well as for the recruiting of their staffs. Let us recall the names of the most important of them, familiar to the student of medical history no less than to the visitor; the Hotel-Dieu and St. Louis, La Charité and La Pitie, Cochin and Broca, La Salpetriere and Necker, Baudelocque and Tarnier, Quinze-Vingt and Lariboisiere, etc. As for the staff—no appointment is made through influence or wire-pulling; exclusively by "concours." There are seven sections: medicine, surgery, obstetrics, neurology, oto-laryngology, ophthalmology and dentistry. The younger men chosen by the jury get the services of the outlying districts to begin with and it is up to them by their increasing reputation as well as maturing years to gradually work up to the better services in the centrally located hospitals. The system works well and brings to the front by natural selection the most capable men.

II.—The Medical Curriculum

Between 450 and 500 medical students register annually for their first year at Paris; the total of medical students, including men and women, French and foreign, numbering more than 5,000. To be allowed to register as a student the beginner must not only be a B.A., but must also have his degree in P.C.N. (Physics, Chemistry and Nat. Sci.) which requires one pre-medical year of preparatory sciences. The B.A. degree is no small matter, requiring 7 to 8 years of secondary education: no curtailed or overlapping studies are permitted. The medical curriculum requires a minimum of 5 years, which are crowned by the presentation of a thesis before a jury. From the very start, his first year, the French student is assigned to hospital work, and this is how the day's work is mapped out: 9 to 11.30: practical hospital work; 1.30 to 4 or 5: laboratory work; 4 to 6 or 7: theoretical lectures, attendance on which is optional.

The assistants in the different services are externes, internes and chefs de Clinique, under the direction of the Chef de Service or Professor. These positions are obtained only through competitive examinations: l'Externat being possibly obtained at the end of the second year. As for l'Internat, this position is most ardently coveted and competed for, as it carries with it lodgings and a small salary and is for five years; for the 60 to 75 yearly vacancies, some 250 to 300 candidates undergo the examinations which are both written and oral.

And so gradually as those chosen work their way up to Chef de Clinique and still higher, a Professorship is only attainable after years of preparation and selective competitions. To one conversant with the French training and medical literature and who has followed the bedside and amphitheatre teaching in Paris, it is no wonder, bearing in mind this long and practical training, that the French clinician is not only a master at exposition but also a capable research worker. To the clearness of conception he brings the talent of exposition, as Osler remarks, and as Wm. Mayo recently wrote: "that intuitive clarity of thought and facile mastery of technic which we associate, and rightly, with the French and Italian schools."

So the medical student in France attends the hospital from the very start and has thus an early opportunity of getting in contact with the patient. And all through his five years he will have to be in daily attendance in the hospital wards and laboratories from 9 to 11.30. His duties are similar to those of "clinical clerk" and "surgical dresser" in the London hospitals. This hospital and bedside coaching is very similar to that received in London and Edinburgh, where small group ward teaching has always been preferred. It stands in absolute contrast to the German method, which favours amphitheatre and large class teaching, unless one takes private lessons from a privat-docent. I never could understand how part of the medical world ever went mad in ecstatic admiration for "this distant and far away from the patient" German method.

III.—Post-Graduate Work

As for this special line of study, Paris offers great and varied opportunities. We all know of the excellent original work which has been carried on in the services of the following professors, who are always glad to welcome new workers in their hospitals.

In *General Medicine:* Professor Chauffard teaches at St. Antoine, Widal at Cochin, Gilbert at the Hotel-Dieu, Sergent at La Charité, Bernard at Laenec, Vaquez at La Pitié, Pierre-Marie at La Salpétriere. In *Surgery*, there are Professor Hartman, Legueu, Delbet, Gosset, Duval, Sebileau, Marion, Cuneo, Heitz-Boyer, Rieffel, Lecene, Dujarrier, de Martel, etc. In *Gynecology:* Faure. In *Orthopedics:* Broca and Ombredane. In *Obstetrics:* Coulevaire, Bar, Potocki, Bouffe. In *Ophthalmology and Oto-Laryngology:* de Lapersonne, Lermoyez, Terrien, Rochon-Duvignau.

For the past year or so, the Faculty of Paris keeps open for citizens of the Allied Nations vacancies as "Internes" to be allocated to men recommended by their respective universities. The International University Bureau of Paris is the official agency through which such positions may be secured and the Canadian representative is Professor du Roure, of Montreal, working in connection with the French Consul, M. Naggiar.

In addition to these positions as "Internes" there are other facilities for advanced work in Paris. Every one knows that the Pasteur Institute under the present direction of Professor Calmette, offers twice a year an advanced and essentially practical course in Bacteriology; also keeping open every department to those desirous of pursuing research work. Last summer I found there a large number of Japanese and Chinese men who had been engaged in research studies for some months. At *La Salpetriere* with its 3,500 beds Professor Pierre-Marie, the earnest successor of Dejerine, will welcome any student desirous of improving his knowledge in Neuropathology. *St. Louis Hospital* with its 1,200 beds, is devoted specially to Skin and Syphilitic Diseases, and every morning the physicians in its outdoor department attend to 250 to 300 applicants. *The Necker Hospital and Terrace* is known to every G-U. specialist. To the *Obstetrician*, the clinics of Baudelocque and Tarnier and the services of Professor Coulevaire, Bar, Potocki and Bouffe offer unrivalled facilities for personal work; some 75 students from Edinburgh University are at present enrolled. In *Ophthalmology and Oto-Laryngology*, I would point to the services of Professor de Lapersonne, Terrien, Rochon-Duvignaud, Luc, Abadie, Guisez. To those interested in special surgery, one will find a ready welcome by Professors Hartmann and Gosset (gastro-intestinal tube); Faure (gynecology); Legueu, Marion, Heitz-Boyer (G-U); Sebileau (goitre); de Martel (cranial); Broca and Ombredane (orthopedics); whilst Delbet, Duval, Cuneo, Proust, Tuffier and Pauchet, Lecenne, Rieffel, Legars, Dujarrier and a host of others welcome the visitor, properly introduced, to their services of general surgery.

Moreover, at different times in the year there are given in the most important clinical services, series of special courses, essentially practical and consisting of clinical demonstrations and laboratory work by the whole staff of these professorial units.

May I mention some of them at random taking place this year:

In Medicine

Professor Gilbert, Hotel-Dieu, April.—A special course on recent medico-surgical ideas, on diseases of the liver and pancreas; July, 1 dem: gastro-intestinal tube;, September, laboratory methods for general purposes.

Professor Chauffard, Hopital St. Antoine.—June, special course, 20 lessons, 150 frs. on diseases of liver, pancreas, gout and diabetes.

Professor Widal. Hopital Cochin, June.—6 lessons on renal diseases; 4 lessons on liver diseases; 6 lessons on blood and serology.

Professor Vaquez, Hopital La Pitié, July.—

Special course on diseases of the heart and blood vessels.

Professor Sergent, Hopital La Charit´, June and July.—I. Applied Therapeutics; II. "Cours de perfectionnement" on pulmonary tuberculosis.

In Surgery

Professor Delbet, Hopital Cochin, April.—Luxations and fractures.

Professor Hartman, Hotel-Dieu, July.—Surgery of gastro-intestinal tract.

Professor Lejars, Hopital St. Antoine, July.—General principles of surgery.

Professor Broca and Renon, Hopital des Enfants Malades, July.—Combined medical and surgical courses on tuberculosis.

Professor Gosset, La Salpetriere Hopital, June and July.—15 lessons: abdominal surgery.

Professor. Duval, Hopital Vaugirard (new): 20 lessons on diseases of the gastro-intestinal tract, illustrated by operations. And the same will be followed in every department.

Suffice it to say that the Paris School has evolved a series of special courses—"Cours de Perfectionnement"—covering every department of medicine and surgery, which are given now in the spring and in September and October; in fact similar to the Ferien cursus we found in olden days in the German clinics. But for those familiar with the German and French methods through personal experience, these courses as given in Paris are superior to those in Germany. The clarity and facility of exposition, the abundance of material and the essentially practical side of these courses have made them very popular amongst French as well as foreign physicians. A few weeks visit to the Paris clinics in the spring and early summer is most fruitful. Nothing is so beneficial in our own medical field as to be cognizant of the advanced work of the important medical schools in Europe; and there are none better than the English and French schools.

It was my privilege, in attending the British Empire University Meeting in England, to visit anew the medical schools and hospitals of London and Edinburgh and of the leading provincial universities. Their organization is of the best and if some of them are striving for better, newer and larger quarters, let me say how we were impressed by the practical way in which the teaching was carried on and of its high order. International ways and methods seemed quite familiar to their leaders.

Let us signal out for our appreciation the interchange movement of medical ideas and methods between the Anglo-Scottish and French schools which is actually taking place. Only a few weeks ago 90 students (75 men and 16 women) from the Faculty of Edinburgh University were arriving in Paris for a special course in obstetrics. The men, divided in 2 groups, were in attendance every morning at Professor Coulevaire's clinic (Baudelocque) and Professor Bar's (Maternite Tarnier), whilst the women attended Professor Brindeau's service at La Pitié.

Still better, Professor Chauffard opened a series of 6 lectures to be given in London by leading men from Paris, whilst six of the most prominent London professors will lecture in the grand amphitheatre of the Faculty in Paris.

There is so much to be gained by such interchange of courtesies where science goes hand in hand with the amenities of life.

THE DE QUERVAIN CLINIC AT BERNE—SWITZERLAND

F. T. H'Doubler, M.D., Ph.D.

Assistant Junior Attending Surgeon,
Augustane Hospital, Chicago

At the DeQuervain Clinic, Insel Spital, Berne, the day begins with an hour given over to the presentation of new cases to the class in surgery. In addition to the new cases are old ones of interest in connection with whom microscopical slides, bacteriological preparations, post operative reports, etc., are shown. The cases are extremely well worked up and are presented by Professor de Quervain himself. The hour is essentially one of surgical diagnosis and, as the many readers of "*Special Surgical Diagnosis*" can easily imagine, is of utmost value.

The operating room is spacious and very well equipped and its smooth and efficient management are well worth study. Professor deQuervain has devised a number of instruments and apparatus. His operating room table and surgical instruments will be found instructive.

It is a mistake to assume that during the morning's work only goitre operations will be seen, for there is always a good variety of cases. However, the most interesting single phase of surgery at this clinic is, I believe, thyroid surgery. In a short time one sees a large number of thyroidectomies, the technique of which is beautiful. Professor de Quervain has ingeniously worked out by injecting colored gelatine into the fascial planes of the neck of cadavers, an extra capsular approach to the inferior thyroid artery. This approach is simple and rapid and the ligating is done on both sides at the outset in all cases as a means of primary hæmostasis. It is followed by ligation of either the superior thyroid artery on one side and the anterior branch of the superior thyroid on the other or of both anterior branches. After this preliminary primary hæmostasis the gland is resected—usually without any hæmorrhage whatever and the remaining portion of the capsule is restored over the gland substance left. The thyroidectomies are done under local anæsthesia. An occasional case of acute thyroiditis or of some thyroid pathology particularly rare in America is to be seen, such as metastasis to bone from a thyroid which is as far as can be determined entirely normal. One sees numerous extremely large goitres, some plunging and some encircling the trachea. Nearly all goitre cases have lateral and anterior x-ray plates to show the relation of the goitre to the trachea.

Also of great special interest is the gastric surgery. Professor de Quervain has been comparing the results obtained by simple gastroenterostomy in cases of gastric ulcer with the results obtained in similar cases by the so-called sleeve operation or anastomosis following excision of the ulcer with a circular band of stomach wall by means of two parallel complete cuts carried transversely through the stomach wall. Both types of operation are being done at the clinic under identical conditions of care and follow up. The variety of cases in general is wide, much the same as in America. For some reasons the knee cartilage cases are more frequent than in America.

At the clinic numerous special investigations are being carried on. A great deal of attention is given to x-ray studies of the gastro-intestinal tract. The wards are open to visiting surgeons and here again many valuable and ingenious devices are to be seen (special splints, frames, suction apparatus, etc.,).

In close association with the surgical clinic is the pathology department under Professor Weggelin. Here is a large collection of microscopic sections of surgical material, and here special investigations of surgical import are carried on. The Physiological Institute stands also in close association with the clinic and here under Professor Asher at all times very interesting investigations are to be seen. At both the Pathological and Physiological Departments visitors are made very welcome. Although Professor de Quervain is a very busy and hard working man he always has time for visiting surgeons and makes them very welcome. He operates six mornings a week at the Insel Hospital and also at a private hospital. He writes a great deal and is active in research and in national problems of general medical interest, serving on many committees. He is also very interested in medical school curricula and reform.

Berne is reached from Paris over night. One can take a car reservation direct through, or can go either via Basle or Geneva. From Berne are delightful week end trips into the neighboring mountains. The city itself is charming and full of points of general, historical and cultural interest. It is a splendid city of "normalcy" in an otherwise much deranged Europe and is ideal for study. From Berne to Italy is a short and direct step.

A visit to Berne will never be forgotten, both because of the great value in seeing Professor de Quervain's clinic and because of the charm of the city and country.

The Doctor's Fee.—So of doctors. They like fees no doubt,—ought to like them; yet if they are brave and well educated, the entire object of their lives is not fees. They, on the whole, desire to cure the sick; and,—if they are good doctors, and the choice were fairly put to them,—would rather cure their patient, and lose their fee, than kill him and get it. And so with all other brave and rightly trained men; their work first, their fee second—very important always, but still second; but in every nation, as I said, there are a vast class who are ill-educated, cowardly, more or less stupid. And with these people, just as certainly the fee is first, and the work second, as with the brave people the work is first and the fee second. And this is no small distinction.—John Ruskin, "The Crown of Wild Olives"—Essay on "Work," 1866. From the Bulletin of the Harvey Club, London.

Editorial

A NEW SALICYLATE

In view of the fact that the salicylates which at present enjoy the greatest use have never proved ideal therapeutic agents, it is interesting to learn that a new chemical substance of this group has been made which offers some promise of replacing the older drugs, particularly aspirin. Ethoxymethyl salicylate, which has the formula

$$C_6H_4{}^{OH}{}_{COOCH_2OC_2H_5}$$

was first synthesized in 1921 by Mr. Herbert P. Foran, in the McGill Department of Chemistry. A detailed report (*) of its action in animals and man will shortly appear from the same University's Department of Pharmacology.

Compared with aspirin, the most commonly used salicylate, ethoxymethyl salicylate appears to offer two points of superiority: (1) Of the two drugs, the new one is the more soluble in water by at least five times, and (2) it exerts no discernible irritating effect upon the stomach.

The latter advantage is due to the fact that the drug is built upon the "Salol" principle, *i. e.*, a free acid radical is avoided by replacing the hydrogen of the carboxyl group by an alkyl radical. This occurs in the case of methyl salicylate, from which the new drug is in one sense derived.

Evidence of freedom from gastric irritation was obtained by feeding 9 grams of ethoxymethyl salicylate to a dog over a period of four days. Dogs similarly treated with sodium salicylate and aspirin, particularly the latter, develop erosions of the mucosa, amounting in certain parts to deep ulcers. The stomach of the ethoxymethyl salicylate dog was found to be perfectly intact.

In other respects, ethoxymethyl salicylate appears to yield results practically equivalent to those of aspirin. The following may be mentioned: (1) It is of about equal toxicity; (2) It exhibits no tendency to injure the heart or kidneys; (3) It exerts an equally good and probably more prolonged antipyretic effect; (4) It is an efficient analgesic in ordinary headaches.

(1) Toxicity studies in rats showed that the minimal lethal dose was the same as that of sodium salicylate—0.4 gram per kilo. In dogs it lies above 0.5 gram per kilo, which is sometimes a fatal dose of aspirin.

(2) Direct intravenous injection in dogs shows no untoward effect upon the heart or circulation until the fatal dose has been approximated; rabbits receiving large daily doses over a period of 20 days exhibited no indication of renal injury.

(3) As regards antipyretic efficiency, the "Coli fever" dog serves as an excellent laboratory test object. In such animals ethoxymethyl salicylate has repeatedly reduced the temperature to normal; in fact, this has been accomplished by the injection of less than 1-25th of the fatal dose. Compared with the equivalent dose of aspirin the result was more pronounced and prolonged.

(4) The analgesic effect has been tested in many cases of ordinary headache, all of the subjects reporting it to be probably of the same efficiency as aspirin.

In acute rheumatic fever, therapeutic tests of ethoxymethyl salicylate have already been made in two cases. Dr. C. Clements, of Professor Finley's staff at the Montreal General Hospital, found the usual complete relief from fever and pain within 48 hours after beginning the

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*Barbour, H. G. and Foran, H. P: *Jour of Phar. and Exper. Therap. 1922.* (In press.)

treatment. 1-gram doses were employed every two hours, reducing to every 4 hours after the third dose.

The urinary excretion of salicyl in man has been studied in two persons, who were found to retain it longer when ethoxymethyl salicylate is given than when taken in the form of aspirin.

The widespread use of drugs known to be irritating to the stomach is well appreciated by physicians. Of the ultimate consequences, in many cases, of the abuse of such irritants we are by no means fully aware. Should the new salicylate, after adequate trial under judicious supervision, prove as harmless and efficient as appears, its introduction will mark a definite advance in our therapy of rheumatic affections.

THE HABIT OF SLEEP

THEORIES as to the cause of sleep are as numerous as are the writers upon the subject but one is perhaps entitled to touch a few of the high spots in the subject and pick out some of the very obvious facts of the matter insofar as they help in the care and the control of those in whom sleep has forsaken its orderly sequence in the day's round.

Laying aside all details and such explanations as greater or less cerebral vascularity, greater or less blood pressure, greater or less dosage of fatigue products, we are compelled to recognize in civilized peoples at any rate the 'Habit of sleep'.

This habit is aided and abetted by certain recurring features of one's environment, such as darkness, cessation from toil, and the influence of suggestion which comes from within through fatigue, and from without as a result of the mass action of one's fellows, who themselves are yielding to repose.

That the habit of recurring nocturnal slumber is not as firmly fixed as some other habits, is shown by the sleeping of wild animals when fed, and their prowling when hungry, and also by the custom of aboriginal races who sleep not by the clock, but from the absence of anything better to do; and this brings up the fact that a very slight alteration in one's manner of life may break up the sleep habit of years. A night in a railway car or in an unaccustomed bed, a night in the city to the country dweller, or in the country to the city man, may break the charm and banish sleep. The nurse or the engine driver, who changes from day to night duty may have difficulty at first in getting sleep but a new habit comes in time, though rarely as firmly fixed as the old one. There are many analogies between the habit of sleep and the habit of defæcation. Each may and should become a fixture in the day's routine, and if nature's rhythmic tendency is given free course each will become a settled feature of the day. Each is largely dependent upon suggestion from within and each is equally subject to inhibition.

What preoccupation and hurry may do to destroy the normal sequence of the emptying of the bowel, anxiety and apprehension may do to tear up the track over which the sleep train passes. Simple explanation of the physiology of defæcation, and the reduction of the day's routine to a plan which allows the patient to carry this lesson into practice, is often enough to correct a long standing constipation, but how is one to exorcise the evil spirit which stands between sleep and the sleepless one? As purgatives destroy the normal impulse to evacuation of the bowel so do hypnotic drugs destroy the habit of normal sleep, and therefore when the obstacle to sleep is a mental one it is through mental rather than medicinal means that it is best approached. There may be phobia of sleeplessness which in its anxiety and apprehension, may quite destroy the normal suggestion of sleep. How may this be attacked? At the risk of dismaying the Psycho-analysist one might use a homely illustration—A boy who has been thrashed in school may come home and kick the cat, or the man who has dropped money in playing the market may become unpleasant to his wife giving as his reason, that his coffee is cold. Now neither the dog nor the coffee was the real question at issue but the inward grievance was transferred to them, and similarly a disturbing idea lying like a sunken log under the stream of consciousness may compel the mechanism of sleep to accept substitution for it. It may take time and pains and tact to bring the sunken idea up into light and air, but this is one way to restore the 'Habit of Sleep'.

The purely physical reasons for the breaking of the normal sleep habit, such as pain, fever, cough etc., suggest their own remedy, but one must bear in mind the ease with which this normal habit may become shunted over the dependence upon the means used to quell the primary irritant, and when we realize that roughly one third of life is spent in sleep, we can see the great advantage and efficiency of having it proceed "under its own steam" rather than from the uncertain pressure of extrinsic forces.

IS A COORDINATED MEDICAL COURSE FEASIBLE? A SUGGESTION

THE present curriculum of undergraduate medical schools has developed piecemeal in the last 25 to 50 years and changes have been made to meet each advance in education as it has arisen. That a reform is needed is indicated by a perusal of the Report of the Carnegie Foundation for 1921 by H. S. Pritchett, of the Proceedings of the Congress on Medical Education in Chicago in March 1922, and of the Symposium before the Edinburgh Pathological Club in 1918. Two striking features of each of the above reports are *First:* The necessity for the abolition of the present watertight compartment system and a greater coordination between the fundamental medical sciences (Anatomy and Physiology) and the subjects taught in the clinical years (Medicine, Surgery, Obstetrics and Gynæcology, the Specialties and Pathology), and *Second:* The beginning of clinical work much earlier in the course.

From the pedagogical and psychological standpoint, educational methods in recent years are undergoing many changes. The greater the number of associated ideas a person develops about a subject, the greater the chance of the memory retaining and recalling that subject. The use of an idea with facility is the objective for which the student strives, and yet the opportunity for the medical student to use or apply his knowledge of Anatomy or Physiology and thereby acquire associated ideas, is not afforded him until one or two years after he has received instruction in these subjects. The proverbial ignorance of the medical student in the clinical years of the principles and facts of these subjects is pretty clear evidence of the lack of development of a sufficient number of such intimately related and associated ideas. In view of the above arguments, suggesting a revision of the present curriculum and with the object of providing opportunities to acquire associated ideas, an attempt has been made to see if it is feasible to draw up a course, in which the chief underlying principle is the correlation of the subjects of Anatomy, and Physiology with those of Medicine, Surgery and Pathology. Presuming that the student has completed his one or two years of premedical work and that he is required to devote his final year to purely clinical and hospital work, the course in the remaining four years might be divided on a somewhat arbitrary anatomical basis as follows:—*First Year:* Upper and Lower Extremity; *Second Year:* Thorax and Head and Neck; *Third*

Year: Abdomen and Pelvis; *Fourth Year:* Nervous System and Special Senses.

First Year: Upper and Lower Extremity. The student would first be given a general introduction to each of the main subjects, namely, Anatomy, Physiology, Pathology, Medicine and Surgery. This would be followed by the dissection, embryology and histology of the extremities and by the study of neuro-muscular physiology; in Pathology, an experimental course on inflammation and infection; a course in general Bacteriology; and the pathological histology of the tissues of the extremities. In Medicine, a general introductory course on the methods of production, recognition and prevention of disease; in Surgery, the course would cover inflammation as it manifests itself in the tissues of the extremities and the general principles of injuries to them.

Second Year: Thorax and Head and Neck. In Anatomy, dissection, histology and embryology of these parts would be covered. Circulation and respiration would form the chief basis of work in Physiology. In Biochemistry, the student would receive instruction in the chemistry of the blood and respiratory gases. The gross and microscopic pathology of the heart, lungs, breast, lip, tongue, jaws, lymphatic glands and thyroid would constitute the work. In Medicine, the physical examination and diagnosis of conditions of the heart and lungs would be dealt with. The surgical aspect of diseases of these parts would form the work in Surgery. Pharmacology would begin in this year.

Third Year: Abdomen and Pelvis. The anatomy of the various abdominal viscera would be as in the previous years. The physiology of digestion and secretion, of metabolism, of the functions of the ductless glands and of reproduction would form the curriculum and the related biochemistry and pathological chemistry would also be covered. The gross and microscopic pathology of the abdominal and pelvic viscera would be the work in this department. In Medicine, the diseases of the abdominal viscera and kidneys would form the main work, while in Surgery, the work would consist of their surgical bearing. In Obstetrics, normal pregnancy would be covered and the methods of diagnosis and treatment of lesions of pelvic organs would be begun in Gynæcology. Pharmacology would be continued in this year.

Fourth Year: Nervous System and Special Senses. In anatomy, the brain, spinal cord and organs of special sense would constitute the work, while their functions would be dealt with in Physiology. Their changes as the result of disease would form the work in Pathology; and the diagnosis and treatment would be given in Medicine and Surgery. The methods of examination of the eye, ear, nose and throat would be taught. Abnormal conditions arising during pregnancy, labour and the puerperium would be the Obstetrics. A course dealing with the problems of preventive medicine, hygiene and sanitation would be delivered.

Although the work would be mainly covered in the above described division, continuity and review could be provided by clinics on interesting cases as they occur in the wards of the hospital illustrating subjects covered in preceding years. Time-tables were prepared, in which the amount of time devoted to each subject was approximately the same as suggested by the Council on Medical Education of the American Medical Association, but space does not permit of their publication. It would appear that such a suggested course as the above is feasible and that its adoption would be an improvement on our present curriculum by providing for a greater coordination of the courses, for more opportunities to develop associated ideas, and for the student to be in attendance at the hospitals for two years longer than he does at present. It is considered that a student who had taken a course as outlined above would have a more practical and useful knowledge of both the fundamental medical sciences and the clinical subjects and in consequence would make a more efficient practitioner than one trained under the existing curriculum.

E. Stanley Ryerson

ULTRA VIOLET RADIATION IN RICKETS

WE publish in this number a report by Dr. Tisdall on the results obtained from the use of ultra violet radiation in rickets in the Hospital for Sick Children in Toronto. Huldschinsky in 1919 was the first to show that when children suffering from rickets were exposed to the rays of the mercury vapour quartz lamp the rachitic process was stopped and an orderly calcification commenced in the bony tissue. In 1921 Howland and Kramer reported investigations demonstrating that the inorganic phosphorus of the serum is markedly reduced in uncomplicated rickets. Experiments on rats showed that a diet containing an excess of calcium but a deficiency of phosphorus and lacking the anti-rachitic factor present in cod liver oil induces in the blood serum of such animals a great reduction in the normal blood content of phosphorus, a condition essentially the same as occurs in rickets in children. In an article (Amer. Jour. Diseases of Children, July, 1922) these same investigators have shown that exposure of such animals to ultra violet light, whether emanating from the mercury vapour quartz lamp, the cadmium spark, or the ferric chromium condenser spark, increases the organic phosphorus content of the blood serum, and stimulates normal calcification in a way closely similar to the action of cod liver oil. So far as could be judged by roentgenograms improvement in the process of calcification occurred in about the same period of time as it does after the administration of the oil.

Dr. Tisdall in the Toronto Hospital for Sick Children corroborates the statement that exposure to these violet rays for short periods of time causes marked increase in both the calcium and phosphorus content of the blood serum in children suffering from rickets; an increase which was followed promptly by clinical and roentgenographic evidences of improvement in the rachitic process going on in the bone.

THE WINNIPEG MEETING

THE Annual Meeting of the Association at Winnipeg June 20-23 was a distinct success from every point of view.

Under the energetic presidency of Dr. E. W. Montgomery the local committees executed their respective tasks with great credit to themselves and to the Association. Four hundred and seventy-five members registered and all scientific sessions were well attended. Concurrently with the Canadian Medical Association the Canadian Radiological Association, the Canadian Society of Anæsthetists and the Canadian Medical Protective Association also held their annual meetings.

Ample accommodation was provided in the Royal Alexandra Hotel, not only for the sessions, general and sectional but for the scientific exhibition of pathological material and apparatus and also for the commercial exhibit. It is to be regretted that in regard to the last named there was some dissatisfaction inasmuch as the space allotted was in many instances off the direct route between the registration rotunda and the assembly hall. The several sectional meeting rooms, however, were in close proximity which aided greatly the ease with which one could slip from one to the other according to the individual interest in the papers being presented.

The excellence of the papers read was fully up to the standard promised by the titles in the programme and the discussions were prompt and not too discursive.

Professor Lewellys Barker and Professor J. M. T. Finney, both of Johns Hopkins University contributed unstintingly, and delivered papers and addresses of high scientific order.

The Friday afternoon general session, which was devoted to a symposium on Goitre, proved to be a battle royal; the discussion which ensued was illuminating and instructive. In fact the whole programme was remarkable for the predominance of papers on subjects possessing interest to all branches of the profession. Keen disappointment was felt that a number of papers had to be omitted because of the absence of the authors. In one section the session was greatly curtailed because of this. It is granted that in some cases the absence was unavoidable but in others it would appear as if the gaining of a place on the programme was not seriously considered as a contract with the members of the Association, and one to be honourably fulfilled.

On Wednesday evening a meeting open to the public was addressed by Drs. Barker and Finney who dealt in no uncertain manner with the dangers to the public of charlatanism masquerading under high sounding modern synonyms.

Living up to the traditions of the West the hospitality and entertainment were conspicuous. The City was en fete for the visit of His Excellency the Governor General, and the authorities graciously included the members of the Canadian Medical Association in the invitations to the luncheon of the Canadian Club and the reception in the Parliament Buildings. A feature much appreciated was the official Association luncheon each day. This was held in the hotel and checked any dispersion of the members thus securing a full attendance in the afternoon sessions. Garden parties, golf, and private entertainment filled every spare moment and the visitors departed feeling that interest in the Association is on the flood tide.

EDITORIAL NOTES

In this issue is to be seen a paper on the "Evolution of Surgery" as seen in the practice of one of the best known of the older surgeons of Ontario. The remarks of one who saw Lister struggling to impress upon the surgical world the great truth of asepsis and antisepsis and who has watched surgery for fifty years should not fail to interest every reader. As a detail of medical history, it is attractive to a degree and, when one is reminded that Osler's great teacher, Bovell, was one who predicted the opening of the abdomen as a matter of routine for diagnostic purposes, we also recognize him as a prophet and agree with Dr. Groves in saying that, even in those early days of Ontario medicine, there were those who dreamed dreams and saw visions.

Papers of this sort remind us that not all knowledge is gathered into the larger cities. The experiences of a practitioner of fifty years in a country district are rarely put on paper. The energy and the initiative which these details indicate make a story of themselves, and vindicate the doctor of the old school in a forcible way.

The Editorial Board of the *Journal* desire to call the attention of their readers and correspondents to the remarks of the Editor of the *British Medical Journal* on an address delivered by Dr. J. A. Simmons, editor of the *Journal of the American Medical Association*. Dr. Simmons has acted as editor of the latter journal for a period of thirty years. Under his management it has developed from a comparatively unrecognised periodical with a small circulation into a very ably conducted journal with a circulation every week of nearly 70.000 copies, printed in Spanish as well as in English, and wielding a powerful influence for good among the profession in both North and South America.

It is the hope of the Editorial Board that this *Journal* will also some day take a high rank in medical literature. To accomplish this desire it is necessary to carry on its publication along lines very similar to those recommended by Dr. Simmons. A selection must be made of those papers which present new facts and new thoughts in a concise and clearly expressed form. In this way only shall we be able to present our readers with an interesting and readable account of the large amount of good work carried on at the bedside and in the laboratory by members of the Canadian profession, while at the same time by means of our abstracts, retrospects and editorials we endeavor to bring before the profession every important scientific advance made in medicine throughout the world.

JOHN McCRAE, M.D.—IN MEMORIAM*

In Northern Gaul sleeps John McCrae,
A Celt united to the clay,
Of that great race; away on high
The spheres make music in the sky
As when a Cæsar had full sway.

Rare soldier bard! thy manner gay
Was wont to change to wistful lay,
When war with Hell did seek to vie,
In Northern Gaul.

Above thy cross let sunlight ray,
And song of lark, throughout the day,
Thy requeim be; let us not sigh,
Almighty God knows all who lie,
Who won or lost in dreadful fray
In Northern Gaul.

E. J. Mullally

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*On a day in the latter part of July, 1914, at the luncheon table of the Royal Victoria Hospital, Montreal, John McCrae interested a group, among whom was the writer, by relating some of his experiences as an artillery officer in the South African war; he had arranged for transportation to Europe and was gaily recounting some of the places he intended to visit during his forthcoming holiday. While on the ocean the Great War broke out; the harrowing experiences he went through at the front, in the early days of the Canadian participation in that momentous struggle most probably helped in lowering his resistance to the pneumonic infection which caused his death in January, 1918, when his fame as the author of the poem 'In Flanders Fields' was international. His body is buried in the cemetery in Wimereux near Boulogne in Northern France. E. J. M.

Studies in Measles.—Fresh confirmation of the artificial transmission of measles has been brought by Kawamura (*Japan Med. World*, February 15th, 1922), who has succeeded in passing the virus through monkeys for three generations. Citrated blood from a boy taken four hours after the first appearance of fever and four days before the occurrence of the eruption was injected subcutaneously into three monkeys in 1 c.cm. quantities. In each case fever commenced eight to nine days following the injection, and was followed in four days by an exanthem of roseolar, papular nature accompanied by rhinitis, conjunctivitis, and the presence of Koplik's spots. In two cases the eruption was particularly marked over the head and face, though present on the rest of the body. The duration of the fever was from six to seven days. Examination of the blood showed the appearance of a leucopenia just previous to the outbreak of the rash. Blood taken from the first monkey was injected into two normal monkeys. Each of these developed typical measles, and from one of them the disease was passed on to three more monkeys. The interest of the present observations lies in the demonstration of the infectivity of the blood in the early stage of measles, the material having been taken from the patient on the very first day of illness.—*Brit. Med. Jour.*, April 29th, 1922.

Men and Books

NOTES FROM AN EDITORIAL CHAIR

NOW and again a medical journalist is given the opportunity of setting forth some of his difficulties. Such an occasion was recently afforded to Dr. George H. Simmons, editor of the *Journal of the American Medical Association*, when he was called on to give an address as President of the Institute of Medicine of Chicago. Very wisely he selected "Medical periodical literature" as his subject, since he could speak from "an acquaintance of nearly thirty years with medical journalism." In what follows we shall endeavour to give the chief points he made, since his observations may be read with interest even by those on this side of the Atlantic who feel that their withers are unwrung. At the same time it has to be admitted that the faults on which he expatiated are not wholly unknown here.

Dr. Simmons began by mentioning incidentally that in 1848, when Oliver Wendell Holmes was chairman of a committee of the American Medical Association on medical literature, the number of medical journals published in the United States was 20, that it had risen to 230 in 1903, and that it had since declined to 120, in spite of a remarkable increase in periodicals devoted solely to scientific medicine. Moreover, Dr. Simmons notes "a distinct change in the type of papers appearing in medical journals to-day as compared with twenty years ago. The therapeutic article of the past, replete with favourite prescriptions, often proprietary in character, has given way to scientific contributions on therapeutic methods, on pharmacology, on pathology, on etiology, on methods of diagnosis, on prophylaxis." Though the number of medical journals has decreased in America, it seems doubtful whether the volume of writing for publication has undergone any diminution, for the *Journal of the American Medical Association* is now receiving between fourteen and fifteen hundred manuscripts a year, exclusive of the papers submitted to the sections of the annual meeting. Dr. Simmons estimates that three-fifths of the manuscripts voluntarily offered are returned, and the greater part of his address was concerned with the reasons for rejection.

One reason is lack of space. A fair percentage of the papers were excellent both in matter and in manner of presentation, and there could be no doubt about them. Among other papers one that is informative, that presents new facts or practical information, if fairly well written, is not returned, though it may be necessary, with the author's help or approval, to shorten or revise. In this connection the subject of length is raised; it, "like Einstein's theory as to space and time, is a matter of relativity. A paper of five hundred words may be long: one of five thousand may be short." But undue length is a common fault, and Dr. Simmons finds three chief reasons for it. The first is "rambling," due to the absence of a plan, so that the author repeats himself and goes a long way round to reach a given point. Cross-headings are recommended, not only because in a paper more than a page or so long they encourage the reader, but because the task of introducing them reveals to the author defects in the logical arrangement of his matter. Next the difficulty many experience in making a beginning is touched upon. If the way to begin a paper is not immediately obvious Dr. Simmons recommends the perplexed author to "go right to the subject without preliminaries"; to begin in the middle if necessary; when the end is reached the difficulty of the beginning will usually have disappeared. Sharpey, the father of English physiology, was at pains to impress on his pupils the importance of learning how to report their results. His first injunction was to state conclusions at the beginning; this was the old plan of the university thesis, in composing which the candidate was required to set out at the beginning the proposition he intended to prove. The influence of Sharpey's teaching is still plainly to be traced in the writings of the chief English physiologists, though some of the lesser lights tend to lapse into presenting their readers with "protocols" of experiments related in laboratory slang. Dr. Simmons would have a long article begin with "a brief digest" to encourage the reader, and end with conclusions reflecting the author's premisses and deductions to help the abstractor. We may interject here that an abstractor who works on this system will often fail to do his duty by his readers.

The second cause of undue length is verbosity—a blemish which, Dr. Simmons admits, exists in the writings of most of us. It is to be remedied by revision; during that process the writer will be astonished to find how many words, phrases, clauses, sentences, and occasionally even paragraphs can be erased without detriment to the meaning. Such deletions not only save space, but improve the style and help the reader.

The third fault enumerated is prolixity or diffuseness—the tedious discussion of non-essential details and the particularizing on trivialities. In an extreme form this fault is displayed by papers (of which it is said the American *Journal* receives specimens every week) in which the author who has a new fact or observation to make buries it in a mass of material which sometimes takes the form of a long historical introduction.

Dr. Simmons has a small opinion, as material for publication in a medical journal, of papers prepared for reading to a medical society; "as a rule, they are not so well thought out or as carefully written as are those prepared especially for printing." Some are composed to fill a vacancy, others are mere pot-boilers. Others, again, are designed to open discussions, and, while fulfilling that purpose, are not suitable for printing without drastic revision; they may be listened to out of courtesy or are carried through by the speaker's personality, but in cold type are not read. Certain societies founded recently in this country have made it a condition that the papers and discussions before them shall not be reported or printed, and from time to time older-established societies decide to put a veto on publication; this course has been taken lately by one of the sections of the Royal Society of Medicine. Were the reporting of meetings to become the exception and not the rule it would probably, by encouraging the tentative presentation of hypotheses and greater freedom of debate, be to the advantage both of medical societies and of the readers of medical journals.

The real remedy for the defects he sees—defects which, in spite of all that editorial staffs can do, continue to mar medical literature—is, in Dr. Simmons's opinion, that the art of writing should be more carefully studied and all writings submitted to thorough revision. In support of this he quotes Sir Clifford Allbutt's method as described in his book *Notes on the Composition of Scientific Papers.* That book is, or should be, too well known in this country to make it necessary for us to quote from it; we will only recall that Sir Clifford's plan is first to jot down ideas and facts on slips of paper and sort them under headings; then to make a first draft and revise it; then a second and revise it; then a third and revise it; and then to put the whole away for at least a week "in order that the final reading may be done with refreshed attention." After an inspection of some of the manuscripts in the Osler Library, which is being catalogued in Oxford before its transfer to Montreal, Dr. Simmons is able to say that Sir William Osler worked in much the same way. He was able to trace one article through its various stages: first there were notes on odd bits of paper, evidently written at odd moments; then there was a rough outline of the paper in longhand; then the first typewritten copy, with interlineations, transpositions, and deletions; next the second typewritten copy, which had been considerably modified; and finally, the third typewritten copy, which had been given to the printer. If, Dr. Simmons pertinently asks, this is the method of the masters, "what about the rest of us?" He concludes his address with an apposite quotation from Barrie: "The man of science appears to be the only man who has something to say just now, and the only man who does not know how to say it."

British Medical Journal, April 29, 1922

Abstracts from Current Literature

SURGERY

Tetanus and its Treatment. Smith, Ernest V. *Jour. Lancet*, March 15th, 1922.

From a review of the literature and an experience with 3 cases of tetanus successfully treated, it appears that tetanus antitoxin has a definite value when given intravenously in sufficient dosage. In determining the dosage, the severity of the case should be taken into consideration. For the adult and severe case, it may require from 150,000 to 200,000 units; however, many cases are reported cured with doses ranging from 60,000 to 100,000 units. The method of choice is the intravenous, and in an acute case this should always be employed. It may be advisable to give 5,000 to 10,000 units in the spinal canal at the same time the initial dose is given. The prophylactic dose of tetanus antitoxin should be at least 2,000 units. Statistics from the war go to prove beyond doubt that it is of great value in the prevention of tetanus, but the fact that tetanus did occur in a delayed type in many cases where it was used adds evidence to the belief that the prophylactic dose 1,000 to 1,500 units was not sufficient. As a prophylactic measure it should be more generally used in all lacerated and penetrating wounds, and especially in compound fractures. For this purpose it is not necessary that it be given intravenously; it may be given subcutaneously. The time should soon come when all railroad companies and employers of labour will urge its use by the physician caring for their injured. In an open discharging wound, or in a healed wound which is sore and painful, the local focus should receive treatment.

A. T. Bazin

Gas Gangrene in Civil Surgery: Report of a Case. Christopher, Frederick. *Internat. Clin.*, Series 32, 1922.

In all lacerations where there has been destruction of tissue and interference with the blood supply from injury to the vessels, and where dirt has been carried deeply into the tissues, the development of gas gangrene must be considered a potentiality. The salient factors in making an early clinical diagnosis are: History of a recent wound, swelling, increased frequency of pulse rate, tympany, crepitus, pallor of the skin, odor, ability to "milk" gas bubbles out of the wound; thin discharge, roentgenographic findings, and the maintained intelligence of the patient. Gas gangrene is associated with 3 species of micro-organisms: bacillus welchii, vibrio septicus and bacillus bellonensis (probably identical with B. œdematiens). It seems desirable that serotherapy be more generally used in the preventive treatment, which to-day consists in *débridement* of the wound, its irrigation by the Dakin-Carrel method, and delayed closure. In developed gangrene, radical removal of gangrenous parts is indicated; multiple free incisions, and Carrel-Dakin treatment Serotherapy will form an increasingly important adjunct to surgical measures as time goes on. In a case described from the service of Halstead, the patient had sustained lacerations and multiple fractures in the left hand. Tetanus antitoxin was given on admission. Gangrene appeared in the fifth digit on the third day; gas bubbles and gas bacilli, were found. The white cell count rose rapidly, (12,000-20,000) and the temperature rose to 103.4F. It was necessary to remove necrotic tissues that included the fourth and fifth digits and their metacarpals. Under the Carrel-Dakin treatment, with daily dressings, the white cell count dropped to 8,900; one week after operation, gas bacilli could no longer be found in smears. Injections of typhoid vaccine were given for a few days to see if foreign protein would augment body defence against the infection. There were severe reactions; white cells were again higher, but the general condition improved and the patient made a good recovery. Skin grafting was successfully performed at a late date.

A. T. Bazin

War Injuries Coming to Subsequent Operation. Jones, Walter M. *Ann. Surg.*, April, 1922.

The results of nerve-suture operations have shown that the suture must be end-to-end and that each severed end must show normal fasciculi. Painful neuromata have been removed from many amputation stumps. The injection of alcohol into the nerve was so painful that the practice has been discontinued. Several cases of nerves caught in scar tissues gave good results after dissecting them free and surrounding the trunk with fat. In the cases of loose bodies in the knee-joints, the Jones semilunar incision is the most practicable; the longitudinal splitting of the patella does not expose the region behind the crucial ligaments and the large curved transverse incision occasionally leaves a relaxed patella tendon. One traumatic knee-joint was resected because it had become the site of tuberculosis. Reconstruction of the metacarpo-phalangeal joints has been successful. During the repair of abdominal herniæ, adhesions of the bowel or omentum were found and freed. The Mayo method of overlapping has given excellent results. Muscle herniæ, probably caused by *débridement*, giving such symptoms as weakness and pain, were operated by direct suture or by fascial transplants. Many foreign bodies were removed under local anesthesia with the aid of the fluoroscope. Certain cases of skull defects in patients suffering with vertigo have been grafted. It was found that cartilage was best for this purpose since bone was generally absorbed within a few years. An attempt to drain an abscess of one year's duration was followed by meningitis and death. Bone-grafts were all autogenous. Three cases of spinal graft were successfully performed in which the spines were not split but the graft was fastened with kangaroo tendon through drill holes to the left side of the denuded spines. Stumps were revised because of spurs, neuromata, foreign bodies, ulcers, painful scars or too short skin-flaps. Scars as a rule were not disabling although several caused limitation of motion because of adherence to tendons. Amputations were performed in cases that had shown but little improvement during a period of two or three years and in which organic changes in the liver, kidney and heart seemed liable to occur. Cases of osteomyelitis have been treated in general by removing all diseased bone with mallet and chisel, swabbing with iodine and packing with gauze.

A. T. BAZIN

Discussion on Postoperative Embolism and Thrombosis. Lockhart-Mummery, J. P. *Proc Roy. Soc. Med.* (Surg. Sect.), London, March, 1922.

Deaths from embolism are probably the worst tragedies of surgical practice at the present time, as not only are there no known means of preventing them, but they seem to be on the increase. Cases of embolism and infarct might be divided into 3 categories: those in which death occurs instantaneously and without any symptoms; or in a few minutes or hours following a crisis, with dyspnea and pain in the chest; and those in which the patient develops signs of consolidation of part of the lung and recovers. Stimulants should be avoided. From the evidence available it is shown that a relative degree of stasis in the veins, or at least a very sluggish venous circulation, must be present before intravascular clotting could take place, as thrombosis does not take place in children, is very rare after operations on the arms, and is most frequent after operations which predispose towards lack of movement in the trunk and lower limbs. Thrombosis in the portal vein and its tributaries is very rare, although its branches are more likely to be damaged during operations upon the abdomen than are the branches of the vena cava. The marked difference in the liability of post operative emboli between the lower part of the trunk and the upper part is explained by the fact that venous circulation in the upper part of the body is controlled by the brain and anything approaching stasis in the big venous trunks of the neck and chest is impossible. However, venous stasis is not the only cause of thrombosis as there is no evidence that mere recumbency or lack of movement would result in thrombosis, apart from operation. Embolism does not occur after rest cures, or in paralyzed persons who have lain in bed for a long time. Recently Collingwood has shown that intravascular clotting did not follow the intravenous injection of thrombin, if the blood was in a condition of circulation, although the amount of thrombin injected was actually sufficient to clot every drop in the animal's body if removed from the vessels. The conclusion was that some other factor than venous stasis must be present and this physiologists have demonstrated to be a substance called thrombokinase This substance, though not present in the blood, was found in varying quantities in all the other tissues of the body. A certain quantity was liberated whenever a wound was made, and the contact of the escaping blood with the thrombokinase present in the wound tissues determined the formation of the clot which sealed up the vessels after a cut. This substance introduced into a vein would produce intravascular clotting if the blood was stationary, but apparently failed to do so if the circulation was active. Therefore, two factors essential to the occurrence of a thrombosis are: a certain amount of thrombokinase in the blood, and a venous stasis. It was concluded that the clot forms during or shortly after operation, that it spreads, and a portion might become detached at any time and produce an embolus, the subsequent result depending on the size of the embolus, where it started in the circulation and where it became arrested.

The only hope of the surgeon lies in preventing the occurrence of intravascular clotting after operations. The present methods of anæsthesia, with a preliminary injection of morphine, probably tend to encourage thrombosis by slowing the blood stream during the dangerous period. Formerly when patients were given gas and ether, with consequent vomiting as soon as they left the table, cases of embolism were not so frequent. Preliminary purgation of the patients should be entirely abolished, or if necessary, be carried out five or six days before operation. The practice of starving the patient before and after operation should be discontinued. A supply of proper mattresses on tops of operating tables, and prevention of patient assuming a constrained position during operation, are points requiring greater attention. The frequency of embolism after gynæcological and gall-bladder operations is possibly attributable to the unnatural positions in which the patient is placed. After operation the patient should be encouraged to move about and the large muscle masses of the legs, thighs and buttocks be kneaded in order to promote venous circulation in the cava. A T Bazin

Pain in Threatened and Real Gangrene of the Extremities: Its Relief. Bernheim, Bertram M. *Am. J. M. Sc.*, April 1922.

In gangrene of the extremities pain plays an extremely important part. It is one of the earliest signs of a failing circulation; upon its control depends the success or failure of the treatment; and it is of prognostic importance. Sedatives, except morphine in doses too large to be practicable, are of little assistance, although bromides and codein are sometimes helpful. Rest is of great importance and is hard to secure, the pain making the patient extremely restless. Therapeutic measures consist of exercises alternately to contract and dilate the larger and smaller blood vessels, which show either spastic contraction or collapse from disuse. Bernheim has his patients plunge the affected part first into a pail of iced water, and then into a pail of water almost at the boiling point, continuing these alternate plungings for five minutes, and repeating the exercise three times a day. Occasionally this treatment is too strenuous, especially when there is ulceration about the nails. Between these treatments the patient uses an electric vibrator over the entire leg and foot for five to ten minutes 4-5 times a day, the leg being rubbed with oil after each treatment. This usually relieves pain. A third measure is to occlude the blood through the affected part by means of a bandage above the knee after the leg has been elevated and all the blood expressed out of it, and after a minute or two to cut the bandage suddenly and drop the leg over the side of the bed. In the healthy leg the blood will flow to the toes in 5 to 10 seconds in the affected one 30 to 60 or even 100 seconds will be required. In addition to the above measures Bernheim gives his patients a course of Ringer's solution by means of the duodenal tube. This usually causes alleviation of the pain, though the reason for this effect is not understood. Baking has not, in his experience been successful. Ulcerations cause exquisite pain and must be treated conservatively; they heal only with improvement in the blood supply. Operative measures are often ineffective, but certain procedures may be necessary if other means fail, and the pain becomes unendurable. Ligation of the femoral vein just below Poupart's ligament has been successful, but the procedure is still in a state of trial. Amputation is the only reliable operative measure, but is sometimes contra-indicated, particularly in cases of diabetes. When diabetes does not exist the problem is less difficult. As to the point at which amputation should be done, Bernheim favours removal of the leg just above the knee, because he has found that when the attempt to save the joint is made the wound is not apt to heal. Amputation is, however, a confession of weakness. It is better to save and recreate than to destroy, and the measures which Bernheim has used have yielded good results. A. T. Bazin

Acute Hematogenous Osteomyelitis. Starr, C. L. *Arch. of Surg.*, May 1922.

Owing to the difficulty of an early diagnosis, the writer has reviewed the entire subject. Osteomyelitis is essentially an inflammation of all structures of the bone and really should be designated a periosteomyelitis. A knowledge of the anatomy is very essential. The nutrient artery enters the shaft at about its middle and divides, sending branches to either extremity, which after numerous divisions, end in fine capillaries near the juxta-epiphyseal line or metaphysis. The epiphysis gets its blood supply from the cortical branches, which find their way in from the cortex along the epiphyseal line and are distributed to the whole of the epiphysis. The cortex of the entire shaft receives its nutrition from the periosteal vessels. Growth takes place on the diaphyseal side of the growing line. The periosteum dips into the epiphyseal line and becomes densely adherent at this point. This may prevent direct extension to the joint.

Osteomyelitis is practically always a blood borne infection from a primary focus situated elsewhere. Staphylococcus aureus and some types of streptococcus are the most common organisms found. Blood cultures are rarely obtained but when present the prognosis is extremely grave. Trauma may determine the seat of invasion. The order of frequency in which the bones are infected are, the upper end of tibia, lower end of femur, lower end of tibia and fibula, lower end of humerus, upper end of femur, lower end of radius, ulna, bones of tarsus, crest of ilium and scapula.

Osteomyelitis is extremely rare in adults. The commonest age is from two to ten years. Boys are slightly more frequently affected than girls. The earliest site of the infection is usually found in the cancellous bone near the epiphyseal line. The author found that from here the infection spreads rapidly along the line of the epiphysis, to the periosteum. Frank pus is here formed and spreads rapidly under the periosteum. The advance is less rapid towards the medullary canal, but this structure is more frequently invaded through the haversian canals, from the periosteal infection.

Roentgen-ray findings are always negative in the early stages. The neighbouring joint is involved in only a small number of cases but may be infected secondary to operation. One may get a serous synovitis in the joint which clears up without aspiration or incision.

In the later stages we get the well known picture of the bony involucrum formed on the under surface of the periosteum, pierced by the sinuses and the gradual separation of the necrotic area or sequestrum by a layer of granulation tissue forming between the living and dead areas. The symptoms are sufficiently important to repeat Following a fall or moderate injury there is complaint of sudden and severe pain, located near a joint. Tenderness is very marked in a limited area. The pulse rate is high, 120 to 130. Temperature averages 103F There is marked leukocytosis as high as 25,000 or 30,000. The later symptoms are redness, swelling and œdema.

The treatment consists of incision over the area of greatest tenderness, through the skin, subcutaneous tissue and periosteum. Keep the incision on the diaphseal side of the epiphysis. If frank pus is encountered it is only necessary to drain for a short time. If no pus is seen, the periosteum is stripped for a short distance on either side of incision to be sure that the incision is not in the wrong place. If pus is still not obtained a series of possibly three drill holes is made from the cortex, obliquely downward toward the epiphyseal line. These are about one fourth of an inch apart at the cortex and extend into the centre of the shaft at the epiphyseal line. Within 24 hours pus is usually draining freely In no case was the medullary canal opened.

In a few cases regeneration of the necrotic area may take place without sequestration. After efficient drainage has been established, operation is delayed until the sequestrum is separated. Then a channel sufficiently large to remove the sequestrum is chiselled through the involucrum, the cavity is gently curetted until it is free of dirty granulation, sponged with iodine, and packed tightly for 48 hours with iodoform gauze after which all drains are removed. Where the cavity is large it is well to flatten the edge to allow the soft tissues to obliterate it. GEO. A. FLEET

Bone Grafts. Poate, Hugh R. G., *M. J. Australia*, Sydney, February 25th. 1922.

The best results are to be obtained by an autogenous graft composed of all layers—bone, periosteum, compact bone and endosteum—which is at once laid into the bed prepared for it, so that exact coaptation of each of these layers is obtained Next, firm fixation in this position is demanded, until such time as bony union is obtained between the graft and its bed. The better the preparation of the bed with its surrounding soft tissues and covering layers, including the skin, the more certain is the success of the graft. In Poate's experience intermedullary pegs have never been employed, owing to the many failures in their use by others In most cases a step operation or the wedging of one end of the bone stripped of periosteum into the other is the correct procedure to secure successful union. Just at much care must be taken to open up beyond the sclerosed bone as is done in preparing a graft bed. Exclusion of the skin surface from contact with instruments which are to be used in the wound is advisable.

Before a bone graft is attempted, all "heavy" scar tissue should be excised some two or three months before the bone is touched. Even then it should be a rule never to attempt a bone graft until the wound has been completely healed for at least nine months. The presence of a sinus or any infective focus at all is a direct contra-indication. In preparing the bed it is essential to open up well through this area into healthy bone and medullary cavity, so as to reach active osteoblastic tissue. Bone which has not had sufficient inherent osteogenesis to develop union in the fractured area cannot be regarded as suitable for grafting purposes, hence the frequent failure of a sliding graft as compared to the inlay, and the futility of using chips of such sclerosed bone to fill in any gaps or cavities. Poate does not favour the twin saw, but uses a single blade for cutting the graft and shaping the bed. A stream of saline solution must be constantly flowing on the contact point of saw and bone, so as to minimize mechanical injury and overheating of the tissues. For the same purpose a slow rate of revolution is safer than a very rapid one, and is more easily controlled. The best site for securing the graft is undoubtedly the tibia in its subcutaneous area and in its distal rather than proximal half. It is generally a mistake to include the tibial crest. Rib or the crest of the ilium is of use only in skull and jaw work. The graft must fill the bed completely, and extend well beyond sclerosed areas into healthy bone. In the radius and ulna the width of the graft should be the full width of the medullary cavity, but in large bones, such as tibia and humerus, the graft must be wide enough to be able to take a considerable amount of strain—10-15 mm. wide.

Before fixation of the graft is undertaken, it is important to see that efficient hæmostasis has been carried out. Firm fixation is one of the fundamental essentials. Most of Poate's work has been carried out with a few strands of kangaroo tendon around the whole thickness of bone and graft, and he does not rely on this to hold the graft in place for more than a few days. Wire, screws, bolts, etc., by virtue of their being foreign elements cannot but disturb the normal bone reaction; if these are necessary it is clear that exact coaptation and firm fitting between graft and bed have not been achieved in the first place. Complete immobilization of the part operated on must be secured and maintained by efficient splinting for at least ten or twelve weeks. Plaster is the best material to use, and both the joint above and the joint below should be included.

A. T. Bazin

Resection of the Small Intestine in a Case of Strangulated Inguinal Hernia. Leo, G. *Paris chir.*, January, 1922.

In a case of strangulated right inguinal hernia, in a woman of 62, a suspicious loop of small intestine was found on opening the hernial sac. The loop was resected, end-to-end anastomosis of the intestine was accomplished, and the wound finally closed without drainage. Cure remained perfect. The mesentery proved to be thrombosed. Resection in this case is believed to have been well advised, in spite of some possibility that simple reduction of the hernia might have had no ill effect. Resection is indicated if even a single point of the intestine remains discolored after application of warm saline solution, provided the anæsthesia is local or spinal, but not general. If the colour of the loop remains red, more or less dark, perhaps, but not abnormal, after applying warm saline, resection may be dispensed with. Resection is naturally less easy, and danger is greater, in proportion as the intestine is unhealthy. In doubtful cases it is best to take no chances, but resect. In this case, and in another similar to it, the patient probably owes her life to the resection.

A. T. Bazin

Drainage of the Lower Abdomen. A Simple Method. Robertson, George. *Practitioner*, London, April, 1922.

When Robertson has had to deal with a large purulent or seropurulent effusion, lying free in the general peritoneal cavity, it has been his habit to introduce a suprapubic drain after exposing the causative lesion, but previous to dealing with the visceral accident. In this way the peritoneum, mechanically traumatized by the necessary manipulations of the chief operation, has less toxic material to absorb, for much of the effusion will escape by way of the suprapubic tube, and flow over the skin surface. It is good practice, first, to expose the lesion, next, to introduce the tube, and then proceed to deal with the visceral disease. It is desirable to make the suprapubic opening as small as possible, consistent with the use of a drainage tube of medium calibre. This little procedure is often the most unsightly part of the operation. To overcome the objections to this method, the writer uses a small "trocar guide", which is very convenient. It makes a small neat wound and is a perfect guide for the tube during introduction. A glass tube is used though a supported rubber tube might be employed. Through a tiny skin incision the "trocar guide" is directed downward and backward. Into the open end of the cylinder above the trocar point, is inserted the glass drain-tube. Two fingers carry a muslin swab of small size which is placed against the suprapubic parietal peritoneum. By pushing the glass onwards the trocar guide is sent into the gauze swab, where it becomes free and is at once extracted by way of the main wound. The glass drain-tube is thus neatly and correctly placed. It may be removed at the end of the operation or one or more hours afterwards.

A. T. Bazin

Clinical Aspects of Abdominal Tuberculosis.

Morley, John. *Brit. M. J.*, London, March 11th, 1922.

The great frequency with which tuberculosis attacks the abdomen in childhood, the variations in its manifestations, and the grave results to which it leads all combine to make it a disease of importance in the abdominal surgery of the first 2 or 3 decades of life. The author states the conclusions to which experience has led him, on the subject of the appropriate surgical treatment, and cases illustrating the points are cited,

General indications for operation in the various types of abdominal tuberculosis are the following: (1) Pain, when it occurs in recurrent, well-defined, colicky attacks, especially if they return with regular periodicity and sharp intensity, signifies a mechanical interference with intestinal peristalsis; this can only be relieved by operative measures. (2) Glandular masses in the mesentery, if not too extensive, and if they do not yield rapidly to constitutional treatment, should be excised; this procedure is particularly urgent when they are associated with colicky attacks of pain. (3) Palpable masses in the ileocecal region associated with signs of chronic intestinal obstruction are an emphatic indication for laparotomy and resection of the tuberculosis ileocecal region, should such be found. (4) The ascitic form of tuberculous peritonitis, is essentially a disease for surgical treatment The operation is free from danger, and its beneficial results are usually dramatic. (5) In the plastic type of tuberculous peritonitis, if the trouble does not yield to the ordinary medical measures, operation may be undertaken with a fair degree of safety, provided that no extensive attempt is made to separate adhesions. There is some ground for hoping that even these apparently desperate cases may make a complete recovery.

A. T. Bazin

Hæmatoma and Abscess of the Anterior Abdominal Wall.

Boppe. *J. de Chir.*, Paris, March, 1922.

The question must be divided according to topographic data: (1) superficial abscess and phlegmon of the subcutaneous tissue; (2) abscess and phlegmon of the sheath of the recti; (3) phlegmon of the prevesical space; (4) phlegmon of the subperitoneal cellular tissue. (1) and (4) do not require much attention, as (1) represents the common furuncles or inflammations of lymphangitic origin and the conditions in (4) are so intimately connected with peritonitis, that they must not be studied with diseases of the abdominal wall. (2) Abscesses of the sheath of the recti are consecutive to surgical interferences (septic operative inoculations); they may be very severe, phlegmonous in character; if the wall is opened a focus of suppurating myositis is disclosed. The infection may be more benign and end in a deep suppurating hæmatoma. But infections of nonoperative origin can also give rise to purulent myositis and the abscesses are, in that case, of metastatic character; typhoid infection, erysipelas, puerperal infection, gonococcic infection, staphylococcic infection are frequently responsible for the abscesses and myositis. Hæmatoma of the recti without any infective cause appears in parturient women before or after delivery, also in young, strong men, after a straining of the abdominal wall, chiefly in cavalry soldiers through an injury caused by the pommel of the saddle or in infantry soldiers, due to jumping. The hæmatoma can be caused also by a rupture of the epigastric artery; this, however, is out of the question as it is recognized and operated upon at once. Such a case of rupture of this vessel was produced in a woman, aged 53, by coughing. The hæmatoma is often caused by rupture of a small branch of the epigastric artery; these hæmatomas, whose seat is somewhat deep (behind the rectus abdominis) heal under treatment with warm packs and bed-rest; at other times they form a cyst, or rather a hæmatic pseudocyst; but more frequently they become purulent and give the classic picture of abscess of the rectus sheath.

(3) The phlegmons of the prevesical space are of 2 varieties: (a) Phlegmons which develop in the prevesical space itself; very often these are consecutive to general infection, as typhoid fever; frequently they have a traumatic origin and are consecutive to fractures of the arch of the pubis with infection of the hæmatoma surrounding the fractured bone; and finally, they may arise after operative interference (cystotomy, suprapubic prostatectomy). In some rare cases, the osteitis of the pubis (or osteomyelitis) is responsible for these phlegmons. A typical case was observed in a boy, aged 14. (b) Phlegmons consecutive to an abdominal suppuration. The acute forms are not very interesting; they may be very limited or occupy a large area. The chronic form, ligneous phlegmon, is sometimes very difficult of diagnosis, because the original abdominal disease has not been recognized. They are characterized by a thick mass of sclerous and fatty tissue, which invades the muscles and transforms them into a lardaceous, nearly cartilaginous tissue. After cutting through this anomalous tissue, we find one or more central, very small abscesses, containing a teaspoonful of creamy pus and very often a foreign body which gave rise to the suppuration. These foreign bodies may be of surgical origin (silk, catgut), or of intestinal origin (tape-worms, pin-worms; biliary calculi). In some cases, peritoneal adhesions consecutive to an appendicitis explain the formation of the abscesses. There are also cases in which the invasion has occurred by lymphatic or arterial channels. The differential diagnosis of these ligneous phlegmons of the anterior abdominal wall is sometimes very difficult. The surgeon may hesitate between an encysted hæmatoma, and a tumour (fibroma). The diagnosis from the cysts of the urachus (when these are suppurating) is quite impossible. A common error is to take such phlegmons for malignant tumours of the wall (sarcoma or metastasis from a visceral cancer). This error has serious consequences, as the surgeon dares not operate in the opinion that he has to deal with a cancer, and operation is the sole rational treatment of these phlegmons. Finally, these phlegmons have been mistaken for deep visceral tumours (ovarian cyst, fibroma, cyst of the liver) and the error in diagnosis has been corrected only at operation.

A. T. Bazin

MEDICINE

Pernicious Anæmia. Christian, Henry A. *Internat. Clin.* 1:8, Series 32, 1922.

The author regards pernicious anæmia not as a blood disease in itself but as a general disease in which the blood and blood forming organs are involved. In cases studied carefully the lesions are not confined to the blood and blood forming organs. Cases occur in which the nervous system is extensively involved while the anæmia is as yet slight. Gastro intestinal symptoms are practically always present and usually precede the anæmia. The presence of anæmia should be regarded as more significant than any single characteristic of the blood. Extensive central nervous lesions with even slight anæmia are symptoms of special importance from a diagnostic standpoint. The best method of treatment up to the present would seem to be transfusion. Evidence of the transfused corpuscles may be found as long afterward as 100 days, and in some instances transfusion seems to start a new activity in blood formation. A final analysis, however, does not prove that the life of transfused patients is greatly prolonged, and up to the present no method has been devised that can be considered as a definite cure. A. H. MacCordick

Whooping Cough and the Value of Vaccines. Hull, Thos. G. *Illinois Health News.* February, 1922.

Whooping cough is a disease which has merited serious consideration since the 16th century To it are attributed each year a relatively high number of deaths. That the causative factor is the bacillus as described in 1906 by Bordet and Gengou seems now fairly definitely established. United States Public Health statistics show that 94.5 per cent of deaths occur in children under 5 years of age, while 57 per cent of all children affected are under 1 year of age. The disease is most readily communicated during the first two weeks, just at a time when the diagnosis is most difficult. A reliable immunizing vaccine would be of great benefit especially in institutions. The efficiency of vaccines obtainable at present is somewhat doubtful. It has been established, however, that 25 to 30 per cent of all children are naturally immune, and

moreover that three weekly doses of fresh vaccine will produce a positive complement fixation in 94 per cent. of the cases vaccinated. The benefit derived from the administration of vaccine after the disease is established is on the whole questionable.
A. H. MacCordick

The Nature of the So-called "Capillary Pulse". Boas, E. P. *Arch. Int. Med.* June 15th, 1922.

The "capillary pulse" has been of interest to clinicians ever since Quincke first called attention to it in 1868 The phenomenon has been attributed to a pulsation of the capillaries

The writer, employing the technique described by Danzer and Hooker, studied a series of cases which exhibited clinical capillary pulse. The details are well set forth, and are of interest.

He concludes that the so-called "capillary pulse" is not a manifestation of a pulsation of the capillaries, but is due to an exaggerated pulsation of the arterioles and possibly of the venules of the sub-papillary plexus of the skin.

F. R. Brown

DERMATOLOGY

Scleroderma Following Nerve Injury. *Arch. of Derm. and Syph.* May, 1922.

This is the report of a case where a blocking of the inferior dental nerve for tooth extraction was followed in three weeks by the development of a patch of scleroderma corresponding very closely to the original area of anæsthesia. It began as a small depigmented spot opposite the extracted tooth, and this quickly spread and developed the typical characters of scleroderma. X-rays of the mandible showed unexplained areas of rarefaction in this region.

In the microscopical examination the point most dwelt on was the apparent absence of nerve fibres, and the case is used as a text to advance the idea that there is a neurological factor underlying this condition. But in the discussion, due consideration is paid to the part played coincidently or otherwise by infection and also by the endocrine system.
H. E. MacDermott

Non-Specific Protein Therapy. Ahlswede, Edw. *Arch. of Derm. and Syph.* May, 1922.

A thorough discussion of such a subject is impossible in so brief an article, but a clear idea is given of the rationale underlying this therapy as at present understood. A rather large field is included in the number of acute and chronic inflammatory conditions which may be improved by this treatment.

The protein used is milk albumin, germ and toxin free. Ten c.c.m. are injected intramuscularly at intervals of three or four days till the reaction is complete.
H. E. MacDermott

BACKWARD CHILDREN.—Backward children are not always, perhaps not often, backward because of either mental deficiency or slothfulness, says the U. S. Public Health Service. Many of them are backward solely because of such ordinary and easily remediable defects as adenoids, near-sightedness, or bad teeth.

A case in point was recently reported by the official representative of the Public Health Service in the eighth sanitary district of Vermont, in which the Service is co-operating in a rural health work project.

Medical inspection of one of the graded schools in October, 1919, showed that it had been thought necessary to instruct in a special room sixteen pupils who had seemed to be unable to keep up with their respective classes. Physical examination showed that each of the sixteen had some serious hampering physical defect (chiefly enlarged tonsils, adenoids, or defective hearing or eye-sight) which, rather than any mental handicap was the probable cause of their inability.

Through the co-operation of the school directors, the facts were brought to the attention of the parents or guardians of the children and all were set right before the end of the year.

On re-examination of the pupils the next December (1920) it appeared that all of the sixteen previously backward children had caught up with their proper grades and were keeping up in them with their classmates. A year later, in December, 1921, some of these sixteen children were among the mental and physical leaders in their grades.

News Items

NOVA SCOTIA

THE clinical activities of the various health centres in Halifax, and some of the field activities of the Massachusetts-Halifax Health Commission as summarized by the Chief Nurse for June, show a total of 599 medical and nursing consultations.

In summarizing the field work, this report sets forth that public health nurses from the Health Centres of Halifax and Dartmouth during June, made a total of 2,793 visits in a total of 1,954 homes, in these communities and adjacent thereto. In addition, the visiting housekeeper made 128 instructional visits into 32 families where nutrition problems were paramount. 1091 families are receiving medical and nursing guidance from all clinics: 821 families are receiving nursing advice in their homes, making a total of 1,912 families receiving health advice from the nurses.

The Preschool Dental Clinic reported a total of 63 consultations, at which 324 operations were performed, and 570 treatments given, and a total of 84 extractions under gas anæsthesia.

Several addresses were given by the staff of Health Centre No. 2 and by the Executive Officer and Tuberculosis Examiner, at the opening of the new Health Centre branch at Turft's Cove on the 24th.

QUEBEC

A SHORT series of informal clinics on the medical and surgical diseases of children including orthopædics will be given by the staff of the Children's Memorial Hospital in Montreal during the last week in August. They will begin on Monday, August 28th, and will occupy the morning hours until Friday, September 1st. The afternoons will thus be available for visiting places of interest about Montreal. As the number of physicians, who can be accommodated in the Hospital is limited, those desirous of availing themselves of these clinics, are requested to communicate with either of the undersigned at the Children's Memorial Hospital, Cedar Avenue, Montreal.—A. MACKENZIE FORBES, M.D., C.M.; H. B. CUSHING, B.A., M.D.

ONTARIO

ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION

Committee on General Purposes.—The Committee on General Purposes met at University College, Toronto, on Tuesday, May 30th, 1922, at 11.10 a.m, with the Vice-President, Dr. E. R. Secord, in the chair. After welcoming the delegates, the president instructed the secretary to call the roll to which 71 responded. The minutes of the previous meeting were taken as read. Carried.

The following communications were then dealt with:

Re Fee Splitting.—Moved by Dr. Mullin, seconded by Dr. McDonald, that this matter be referred for action to the incoming directors. Carried.

Re Canadion College of Physicians and Surgeons.—Dr. Anderson—"We should move slowly in a matter of this character." It was moved by Dr. Mullin, seconded by Dr. Morgan, that the communication be referred to delegates of the Canadian Medical Association to be reported upon in the afternoon. Carried.

Re Invitation for Next Annual Meeting.—Moved by Dr. McDonald, seconded by Dr. Cody that the invitation from Essex County Medical Society for the next Annual Meeting be referred to the nominating Committee. Carried.

Re Definition of Practice of Medicine.—Moved by Dr. Anderson, seconded by Dr. Daley that the communication from Western Ontario Academy of Medicine re the definition of the practice of medicine, etc. be referred to the Joint Advisory Committee. Carried.

Re Workmen's Compensation Board.—Moved by Dr. Mullin, seconded by Dr. McDonald that the communication from the Kingston and Frontenac Medical Society re the Workmen's Compensation Board be referred to the Committee appointed to deal with those matters. Carried.

Re Applications for Affiliation.—Moved by Dr. Mullin, seconded by Dr. Wishart that the applications for affiliation from five county societies, namely, Victoria, Sault Ste. Marie, Stormont and Glengarry, Renfrew and Haldimand, and also the letter defining the limits of jurisdiction of the Hamilton Medical Society and the County of Wentworth be referred to the committee named for that purpose by the Chair.. Carried. The following Committee was named to deal with the matter: Drs. Argue, Anderson and Brandon. Moved by Dr. Mullin, seconded by Dr. Argue that the meeting go into a Committee of the whole to discuss the directors' report. Carried. The Chair named Dr. Robt. T. Noble as Chairman of the Committee of the Whole. On motion of Dr. Henderson, seconded by Dr. Farley, it was resolved that the Directors' Report be received and discussed clause by clause. The Secretary then presented the clauses *seriatim.*

Re Semi-Annual Business Meeting.—Moved by Dr. Mullin, seconded by Dr. Farley that the question of the semi-annual business meeting be referred to the directors with the recommendation that such a meeting become a regular feature of the Association, and that the committee on general purposes be empowered to transact all business at the semi-annual business meeting without reference to a business session of the Association, upon the business receiving a two-thirds majority vote of the members of the committee on general purposes present and voting. The motion, on being put to a vote, was declared lost. It was decided that the matter of the income tax be again referred to the Canadian Medical Association. Upon completion of the consideration of the report of the directors, Dr. Secord moved its adoption. Dr. Noble, in quitting the Chair of the committee of the whole, moved the adoption of the report of the committee of the whole. Carried.

The report of the Treasurer as printed having been presented, it was moved by Dr. G. Stewart Cameron, seconded by Dr. M. H. V. Cameron, that the report be received and adopted. Carried. The question of office quarters was referred to the incoming Board of Directors. In addition to the report presented, the Treasurer gave a complete resumé of the administration of the "Red Cross Fund", showing that, out of the $5,000.00 received, $3,506.52 had been disbursed up to the present time. The Treasurer also presented the budget for the balance of 1922, which showed a minimum estimated expenditure of $6,000.00 for the balance of the year from a present credit balance of $7,504.91.

The Committee on Affiliations approved of the action of the Board of Directors and recommended the complete affiliation of the following societies: Stormont and Glengarry, Haldimand, Sault Ste. Marie, Renfrew and Victoria. The Committee further approved the resolution of the members of the medical profession in the county of Wentworth and the city of Hamilton providing for the inclusion of the county of Wentworth within the limits of jurisdiction of the Hamilton Medical Society, and recommended that the Hamilton Medical Society be the affiliated county society for the county of Wentworth and the city of Hamilton.

The report of the Editorial Board was received and adopted.

The report of the Committee on Mental Hygiene was presented and adopted.

The report of Committee on Inter-Relations of the Medical Profession and the Public was presented, and the discussion held over until after the round table dinner. Reports were presented on hospital standardization, on ethics, on public health.

The report of the Committee on Necrology was received and adopted by a standing vote.

Reports of the Programme Committee; and the Committee on Arrangements were then presented and adopted.

In connection with the report of the Committee on Tariff it was agreed that each practitioner in the province be supplied with that section of the tariff applicable to his practice.

The Report of the Advisory Committee to the Board of License Commissioners was adopted. In speaking to this report Dr. Routley advised, "That the committee on general purposes carefully consider the pros and cons of the reappointment of this committee with due regard to the danger involved in splitting the ranks of the Association." Dr. Ferguson endorsed Dr. Routley's remarks, but thought there was no need of the Association being split on the matter.

Dr. Daley asked, "Did the committee give a ruling on the number of 50 (maximum prescriptions)?" Dr. Routley replied, "No." Dr. Mullin considered that county societies should have an appointee to work along with the advisory committee. This was carried. It was then moved by Dr. Farley and seconded by Dr. Mullin, that the appointment of an advisory committee to the board of license commissioners be recommended. This was carried.

The Report of the Workmen's Compensation Board Committee was presented and adopted. The following points were noted in the discussion:

Dr. Argue—"The Ontario Medical Association should repudiate the present workmen's compensation tariff."

Dr. Wilson—"Protests in many ways should be carried on by an active committee."

Dr. McDonald—"Our newly adopted tariff should be sent on to the workmen's compensation board."

Dr. Ferguson—"The Committee is doing good work."

Dr. Cruikshank—"The Ontario Medical Association should discuss this matter with the College of Physicians and Surgeons, and, in this and every other particular, work with the College of Physicians and Surgeons at every opportunity."

Dr. Mullin—"Has the College of Physicians and Surgeons power to say that the fees of the Workmen's Compensation Board are adequate?"

Dr. Argue—"Workmen's Compensation fees are better than nothing."

Dr. King—"The "College" is responsible for the present workmen's compensation tariff."

Dr. Routley—"Would suggest the appointment of a joint committee of the Ontario Medical Association and the "College" to deal with the Workmen's Compensation Board."

Dr. Tovell—"An x-ray man should be on any such committee which meets with the Workmen's Compensation Board."

Dr. Daley—"Many plants name their own doctors and list them on signs in the shops."

Dr. King—"The act says that the employer shall provide medical attendance, which will no doubt justify the action pointed out by Dr. Daley." The discussion having been concluded, the adoption of the report was declared carried.

The Report of the Committee on Pharmacy was presented by Dr. Henderson and adopted.

Report of the C. M. A. Delegates re Canadian College of Physicians and Surgeons was read by Dr. Marlow. In outlining the project he stated that the formation of such a College had in view many advantages to the profession, particularly the ear-marking of qualifications of Canadians by Canadians. Queen's University endorses the plan; the Western University does not at the present time endorse the plan; the University of Toronto considers the project a very large one, but will lend its support if the C. M. A. decides to go on with it. Several men, in rising to speak on the question, pointed out the following: that the committee should present more detail as to the aims and objects of the "College"; that the Association should not commit itself to an unknown quantity; that the matter is too complicated to be given our unqualified approval; that, although we favour post-graduate work, it is not certain that the plans being outlined are feasible for this country. It was finally moved by Dr. Marlow, seconded by Dr. Argue, that the O. M. A. endorse the proposal to establish a "Canadian College of Physicians and Surgeons" for the purpose of promoting post-graduate work and its recognition by diploma. Carried.

The following was then declared the Committee on Nominations: Dr. Farley, Dr. Mullin, Hamilton; Dr. F. W. Hughes, Weston; Dr. H. R. Hamilton, Lambton; Dr. Colbeck, Niagara District; Dr. Scott, York; Dr. Keith, Sault Ste. Marie; Dr. Daley, Hastings; Dr. Watt, Brantford; Dr. McLay, Oxford; Dr. Boyd, Victoria; Dr. Moore, Perth; Dr. Harris, Dr. King, Dr. Marlow, Dr. Cleland, Academy of Medicine, Toronto; Dr. Cruickshank, Essex; Dr. Argue, Ottawa; Dr. Wood, Peterboro; Dr. Lewis, Simcoe. It was decided that the nominating committee should meet immediately following the business session of the Association on Wednesday morning, *re* Sault Ste. Marie letter. Moved by Dr. Elliott, seconded by Dr. Routley, that the Sault Ste. Marie medical society be advised that there is no objection to the resolutions as drafted being placed before their members for their guidance. It was pointed out, however, that it was not within the province of the O. M. A. or a constituent society to prevent the coroner issuing a certificate, as he must in all cases be guided by the circumstances. The motion, on being put to a vote, was declared carried.

After discussion it was moved by Dr. Elliott, seconded by Dr. Marlow, that the Kingston and Frontenac Medical Society be advised that the Workmen's Compensation Board are within their rights in having a representative visit and report upon a patient without reference to the attending physician or surgeon; (the question is not one of medical ethics), and that the report be received and adopted Carried.

The Report of Committee on Education was presented by Dr Mullin, and adopted. Before the motion was put, several speakers spoke very warmly of the work that had been carried on by the Committee on Education.

Re the Red Cross Grant.—Moved by Dr. Mullin, seconded by Dr. Farley, that the incoming Board of Directors be instructed to endorse acceptance of the Red Cross Grant for another year, and that the Ontario division of the Red Cross be so advised. Carried.

The Report of the Committee on Venereal Disease was presented by Dr. Routley, seconded by Dr. Argue, and adopted. Carried.

It was moved by Dr. Wilson, seconded by Dr. Henderson, that the incoming Board of Directors be instructed to appoint a committee to inquire into the modern methods of industrial medicine and to act in conjunction with the provincial department of public health. Carried. The meeting adjourned at 5 15 p.m., to be followed at 6 30 p. m. by the Round Table Dinner. The Committee on General Purposes reconvened at 10 30 p. m following the round table discussion, which discussion had been largely centred upon the report of the committee on inter-relations. It was then moved by Dr. Young, seconded by Dr. Cameron, that the report of the Committee on Inter-relations be received and adopted. Carried.

The degree of doctor of medicine was granted to eighteen candidates at the convocation exercises of Western University, London on May 26th. Dr. Joshua Hugh Lewis was the winner of the J. B. Campbell Memorial Scholarship in Medicine. Of the graduating class of eighteen, seventeen took the licensing examination of the College of Physicians and Surgeons of Ontario and sixteen were successful; one member of the class took the examination of the Dominion Medical Council and was successful.

BRITISH COLUMBIA

The Annual Meeting of the British Columbia Medical Association, District No. 4, was held in Kelowna on June 8th. There was a large attendance of doctors from Kamloops, Vernon, Summerland, Penticton and Kelowna. The retiring President, Dr. W. J. Knox, gave an address in which he reviewed the year's work and what his hopes were for the future of the organization. There was a general discussion of many subjects, in which every doctor present took part, and the meeting was in every way a great success. The next meeting is to be held at Kamloops on October 4th. The following officers were elected for the coming year: President.—Dr. Osborne Morris; Vice-President.—Dr. J. S. Burris, Kamloops; Secretary-Treasurer.—Dr. W. Arbuckle, Vernon; Representative to Executive of British Columbia Medical Association.—Dr. H. H. Murphy, Kamloops; Delegates to August Meeting of British Columbia Medical Association.—Dr. F. W. Andrews, Summerland, Dr. H. M. McGregor, Penticton.

The British Columbia Medical Association is nearing the end of its membership campaign. A recent tour of the Executive Secretary through the Okanagan and Kootenay Districts in addition to coast cities in the north, *viz.* Powell River, Ocean Falls, Prince Rupert and Anyox, resulted in 100 per cent. of the profession joining the Association. There is now no question as to the opinion of the medical men in this Province in regard to the necessity of united action in the various much needed reforms which are at present receiving the earnest consideration of the Executive and Committees.

The Annual meeting of the British Columbia Medical Association will be held during the week ending August 26th. The Monday, Wednesday and Thursday evenings of that week have been allotted to the Association by the Vancouver Medical Society, which is holding its Summer School during that week.

Dr. M. T. MacEachern, Surveyor of the Victorian Order of Nurses for Canada, and who is on leave for one year from his duties as General Superintendent of the Vancouver General Hospital, paid a short visit to the city recently, on which occasion he participated in the graduation exercises of the nurses' training school, when the class, numbering 66, a record, received their diplomas.

Dr. D. J. Barclay has been appointed Medical Officer of Health for Kaslo, B. C.

Dr. A. S. Monro has been elected first Vice-President of the Pacific North West Surgical Society.

GENERAL

REPORT OF FIFTEENTH ANNUAL MEETING OF THE AMERICAN AND CANADIAN SECTIONS OF THE INTERNATIONAL ASSOCIATION OF MEDICAL MUSEUMS

A Most successful meeting of this Association was held at the Army Medical Museum, Washington, D.C., on Monday, May 1st, 1922. A large attendance was present, including representatives of the medical service of the American and Canadian Governments. In his opening remarks, the Chairman, Dr. James Ewing of Cornell University, emphasized the growing importance of the Association because of its devotion to the interests of the science of Morphology, which must ever remain the fundamental branch of medicine. An excellent programme, dealing principally with museum technique and morphological pathology, was presented and thoroughly discussed.

Bulletin VIII, *Journal of Technical Methods and* Bulletin IX, the *Sir William Osler Memorial Bulletin*' were ordered published and will be distributed in the near future. Upon recommendation of the Council, the Exchange Bureau and Bureau for the preservation of the results of medical research of this section of the International Association of Medical Museums was transferred from the McGill University Medical Museum to the United States Army Medical Museum in Washington, D.C.

The following officers were elected for the ensuing year: President.—F. B. Mallory, Boston; 1st Vice-President.—H. T. Karsner, Cleveland; 2nd Vice-President.—H. Marshall, Virginia; 3rd Vice-President.—R. A. Lambert, Yale. Councillors: A. S. Warthin, Ann Arbor, Mich.; James Ewing, New York; W. T. Coplin, Philadelphia; William Boyd, Winnipeg; H. E. Robertson, Mayo Clinic, Rochester; Major G. R. Callender, Washington, D.C.; Major James F. Coupal, Washington, D C., H. S. Haythorne, Pittsburgh, Pa.; Carl V. Weller Ann Arbor, Mich.; Stuart Graves, Louisville, Ky.; L. J. Rhea, Montreal. Secretary-Treasurer.—Dr. Maude E. Abbott, McGill University, Montreal. Assistant Secretaries.—Dr. Harold Segall, Montreal, Dr. W. W. Beattie, Montreal.

At the close of the scientific programme the meeting adjourned to inspect the large recent accessions to the Army Medical Museum and a series of special exhibits from members of the American Association of Pathologists and Bacteriologists and its conjoint Societies, the International Congress of Opthalmologists, the Canadian Army Medical Museum, and the Pathological Museums of Pittsburgh and McGill Universities, which had been set up in the spacious halls of the Army Medical Museum under the ægis of the International Association of Medical Museums.

Obituary

DR. M. I. MCLEAN

Dr. M. I. McLean, Mayor of North Sydney died suddenly on June 27th while preparing to go out on his professional duties. He graduated at Dalhousie College, and shortly after graduation took a post graduate course in London University. A few years ago he spent another six months studying in the surgical wards of Johns Hopkins Hospital, and also in the hospitals of Philadelphia and New York. Dr. McLean was regarded by his confreres as an able and conscientious surgeon ever considerate of the best interests of his patients. His genial personality and unvarying kindness endeared him alike to patients and confreres.

Book Reviews

The Mechanics of the Digestive Tract by Walter C. Alvarez M.D., Assistant Professor of Research Medicine, University of California, 8vo, pages xii, 192 with 22 illustrations. New York, 1922, Paul B. Hoeber. Price, $3.50.

In this little book of 183 pages, Dr. Alvarez has enlarged and elaborated the material of a lecture given by him before the meeting of the American Roentgen Society in 1920, in which the observed phenomena of peristalsis were discussed from the standpoint of rhythmicity, irritability and latent period. The writer has undertaken to make the book sufficiently readable and practical to be of use to the physician looking for help in the problems of practice, while embodying sufficient technical detail for the research student who is interested in the physiology of digestion. A chapter on technique and a complete bibliography are added for the use of the latter class.

Starting from the observation that different parts of the gastro-intestinal tube manifest differences in irritability, and noting as is well established that rhythmic contractions can be induced in the excised stomach or bowel, the writer proceeds to establish the autonomy of myenteric action and to investigate the existence of a pace maker for contraction waves and the presence of gradients of irritability which determine the direction of the resulting peristalsis.

In the rabbit the gradient of rhythmicity is shown in that the duodenum contracts at about twenty to the minute while the lower ileum contracts at ten, and it can be shown that the rate varies inversely with the distance from the pylorus. The basis of this gradient must be the physiological activity of the tissue, and the author and his collaborators have demonstrated a gradient of metabolism in CO_2 production and also in the catalase content of the muscle, while measurement of electrical activity supports this view; other related gradients which run parallel are those of latent period, tonicity and irritability.

The observed facts of these gradients find a practical application in the study of the passage of food through the tract and in the effect of mechanical factors such as diseased conditions and alterations produced by operative interference, diarrhea may be caused by irritation in the gastro-duodenal area, causing a heightened gradient at this end, while appendicitis or obstruction in the lower end of the ileum by raising the otherwise lower level, causes delay and even reverse waves with vomiting. Gradients in the large bowel are hard to demonstrate. Generally speaking, tone is higher in the rectum and sigmoid than in the cæcum and ascending colon, thus preventing the bowel contents from packing into the lower part too quickly, and the author's observation is that all cases of constipation are spastic, with stagnation in the rectum and tightened sphincters.

Reversed peristalsis with regurgitation and vomiting, the vomiting of pregnancy and that associated with lesions in the lower abdomen and pelvis, and the fact that substances introduced *per* rectum may be tasted or even vomited, are studied from the standpoint of gradients in the tract and an interesting explanation given.

On the whole, the book is most refreshing and stimulating to thought and serves to give a rational basis for the study of many phenomena which have puzzled the internist. The writer frankly separates what is well supported from what is conjectural, and further work will be awaited with keen interest. A. J. M.

Aids to Organotherapy. Ivo Geikie Cobb, pages viii+183, price 5s. Bailliere, Tindall and Cox, London, 1922.

This neat, well printed book is a compilation, not very critical nor accurate in character. The author seems entirely ignorant, for example, of the epoch-making work of Kendall, and of the Mayo school, on the thyroid, its active principles, its physiology and pathology. While the book contains many interesting facts, it contains such inaccuracies as, for example, that on page 12, where in the first paragraph, pituitary is said to act on the sympathetic, not on the parasympathetic, while in line 29 it is stated to act on the autonomic (or parasympathetic). On page 36 he refers to "polypharmacy, which is mercifully now a thing of bygone days," yet he devotes several labored pages to a justification of polyglandular therapeutics. Both polypharmacy and polyglandular therapeutics are due to the same cause, inaccurate or incomplete knowledge or thinking lacking in clarity. A member of the profession who wishes to be convinced of the advantages of organotherapy will find this book a useful aid.

V. E. H.

Transactions of the American Surgical Association. Volume the thirty-ninth. Edited by John H. Jopson, M.D., Recorder for the Association. Containing the papers read before the Association at the meeting held June 14th, 15th and 16th, 1921. Pp. 779, with numerous illustrations

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Where it is impossible to mention each article individually, we as Canadians may be more than usually interested in: "Further data concerning the experimental production of pneumonia," by Edward Archibald, of Montreal; "The cancer problem," by Herbert A. Bruce, of Toronto; "Congenital [illegible] of the lower part of the [illegible]," by George E. Armstrong, of Montreal, and "Carcinoma of the lower part of the sigmoid in a boy fourteen years of age," by Ingersoll Olmsted, of Hamilton. There is also a commendable contribution to the study of the fracture problem consisting of thirteen papers, comprising the final report of the committee on fractures, and some special articles by individual members of the committee. The entire volume is a veritable mine of valuable information to the surgical worker. E. R. S.

The Heart Rhythms. Paul Dudley Lamson, M.D., 8vo. Pages 104 with numerous figures. Price, $2.75. Williams and Wilkins, Baltimore, 1921.

This well printed and illustrated book may be safely recommended to the physician who wishes to become familiar with the outstanding methods for the study of the irregularities of the heart. The important methods of study of the action of the heart, the apparatus used and the curves obtained, are simply and accurately described. The methods employed in the analysis of polygraphic curves and electrocardiographic records are adequately outlined. The author is a little too dogmatic to be justly scientific but this is pardonable in an attempt to make easy and simple a difficult problem. The physiology and pathology of the causation of the irregularities are not dealt with. It is merely a study of methods and their results. V. E. H.

The Surgical Treatment of Non-Malignant Affections of the Stomach by Charles Greene Cumston, M.D., and Georges Patry, M.D., Lecturers at the University of Geneva; Members of the Surgical Society of Switzerland. With an Introduction by Sir Berkeley G. A. Moynihan, K.C.M.G., C.B., M.S., Professor of Clinical Surgery at the University of Leeds. Philadelphia, J. B. Lippincott Company, Montreal. Octavo, 349 pages. Cloth, $5.00.

This work presents a very thorough and exhaustive discussion of the various non-malignant affections of the stomach, and of the surgical treatment thereof. While written primarily from the surgical standpoint, the authors' aim has been to treat those questions which appear to us interesting to both the physician and the surgeon; otherwise put, to make the monograph a medico-surgical treatise on the subject.

The conclusions presented by the authors as to the best surgical procedures to be carried out in the treatment of the various conditions are evidently based not only on a wide personal experience, but also on a thorough acquaintance with the work of the best Continental and British clinics. It is somewhat surprising that there are not more references to the work of American surgeons, which in this particular field is by no means negligible. The attempt to make the treatise exhaustive has resulted in a certain verbosity with a tendency to repetition, but the volume is one which will certainly well repay a careful reading. E. R. S.

Books Received

Pulmonary Tuberculosis—Its Etiology and Treatment by David C. Muthu. Size Demy 8vo, pages VIII and 381. Plates 28, price 12s 6d net.

Endocrine Therapeutics Practical Suggestions by Thomas Bodley Scott. 118 pages. Price 5s net. Published by H. K. Lewis and Co. Ltd, 28 Gower Place, London, W.C.1, 1922.

Aids to Bacteriology—By William Partridge, F.I.C. Fourth Edition. 276 pages. Price 5s. Published by Baillière, Tindall and Cox, 8 Henrietta Street, Covent Garden, 1922.

Collected Papers of the Mayo Clinic, Rochester, Minn.—Edited by Mrs. M. H. Mellish. Vol. XIII, 1921. Published May 1922. [illegible] pages. [illegible] illustrations. Cloth, $12.00. W. B. Saunders Company, Ltd. J. F. Hartz Co. Limited, Toronto.

Annual Report of Medical Department of the United Fruit Company—dealing with research, hemoglobinuric fever, malaria and dysentery, hookworm, bacillary dysentery, and other diseases of tropical countries, also venereal disease. The report is a finely printed book of [illegible] pages, illustrated. It will be sent to any physician free of charge on application to the United Fruit Company, Boston, Mass.

Manual of the Diseases of the Eye. For students and general practitioners. By Charles H. May, M.D. Tenth Edition, revised. 377 original illustrations, including 23 plates with 71 colored figures. Price [illegible] net. Published by William Wood and Company, New York, 1922.

International Clinics—By leading members of the medical profession throughout the world. Edited by H. R. M. Landis, M.D., Philadelphia, with the collaboration of Chas. H. Mayo, M.D., Rochester. Vol. II, thirty-second series, 1922. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Practice of Medicine. By A. A. Stevens, M.D. Illustrated. Octavo of 1,106 pages. Philadelphia and London: W. B. Saunders Company, 1922. Cloth, $7.50 net. J. F. Hartz Company, Ltd., Toronto.

The Writing of Medical Papers.—By Maud H. Mellish, Editor of the Mayo Clinic Publications. 12mo of 157 pages. Philadelphia and London, W. B. Saunders Company, 1922. Cloth, $1.50 net. J. F. Hartz Company Ltd., Toronto.

Aids to Organotherapy. By Ivo Geikie Cobb, M.D., M.R.C.S. 183 pages, price 5s net. Published by Baillière, Tindall and Cox, 8 Henrietta Street, Covent Garden, London, 1922.

Maladies du Cervelet et de l'Isthme de l'Encephale—By Henri Claude and Levy Valensi. Published by J. B. Baillière et fils, 19 rue Hautefeuille, Paris, 1922.

Transactions of the American Surgical Association.—Vol. 39, edited by John H. Jopson, M.D., recorder of the Association. Published by William J. Dornan, Philadelphia, 1921.

The Relations of Tuberculosis to General Bodily Conditions. F. Parkes Weber, M.A., M.D., F.R.C.P., pages 27, size Demy 8vo, price 2s 6d net, paper cover.

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Disappearance of Malaria in Denmark.—The issue of *Nature* for March 9th, the appearance of which was delayed owing, as we are informed to labour troubles, contains an interesting note on a paper on Danish mosquitos by Dr. C. Wesenberg-Lund, who has made a long and very careful research into the biology of mosquitos in Denmark. In dealing with the three species of anopheles—*A. plumbeus, bifurcatus,* and *maculipennis*—found in Denmark, particular attention is given to the biology of *A. maculipennis,* which is regarded as the chief carrier of malaria in Europe. The author states that in Denmark this species sucks blood from domestic animals, pigs, cattle, and horses, that it is seldom seen in the open, but is found, often in incredible numbers, hanging, sluggish and blood-filled, from ceilings of pigsties, cowsheds, and stables. Only exceptionally does it suck the blood of man, whereas in Mediterranean countries it is an outdoor species feeding largely on human blood. He considers that in Denmark *A. maculipannis,* which is there living near the northern limit of the range of the species, has ceased to be an outdoor species sucking the has ceased to be an outdoor species sucking th blood of man, and has taken to an indoor life and restricted its attacks to farm animals. This change in habits has, he thinks, been the main factor in the disappearance of malaria, the last great epidemic of which took place in Denmark in 1831. The change in the habits of the mosquito followed, he says, an alteration in agricultural methods about a hundred years ago. Whereas, previously the swine had been driven to the woods to feed on mast, they and other farm animals were thereafter housed, and the stables form so many traps which attract mosquitos by the odour and heat of the animals within; once within the stable the mosquitos find all they need until the time arrives for pairing and egg-laying. Thus the connection between man and *A. maculipennis* has been broken in Denmark, and malaria was, therefore, bound to disappear. The author remarks that, if the measurements of the length of the mosquito given by Meigen (1818), when the species presumably fed in the open and largely on man are correct, there has been an increase in size during the intervening century, in spite of the fact that in Denmark the species is living near the northern limit of its range.—*The British Medical Journal,* March 25th, 1922.

Etiology and Prognosis of Serous Pleurisy in Children.—Neuland (*Klinische Wochenschrift,* March 4th, 1922) mentions the opinions of various authors who estimate that in so-called idiopathic serous pleurisy in the adult more than half of the patients, sooner or later, and mostly within the first five years, suffer from tuberculosis of the lungs. These authors regard a serous pleurisy of the adult, which neither by the history nor by clinical examination can be attributed to any primary disease, as a tuberculous pleurisy. From his observation on 45 cases Neuland attempts to decide (1) if serous pleurisy of unknown etiology is also tuberculous in children; (2) if tuberculosis of the lungs follows a serous pleurisy in children so frequently as in adults. As regards the first question, Neuland found that 10 out of the 45 cases examined failed to give the cutaneous tuberculin reaction. He concludes that we cannot regard all cases of serous pleurisy, of unknown origin, in children as tuberculous, and that serous pleurisy in children is not so frequently tuberculous as in the adult. Moreover, whilst not denying the close relation between serous pleurisy and tuberculosis, Neuland thinks we are not justified even in concluding that all cases giving a positive cutaneous tuberculin reaction are tuberculous. As regards the second question, the subsequent development of tuberculous lung disease, he was able to obtain information in 29 cases. Of these 29 cases, 24 had given at first a positive Pirquet tuberculin reaction, 5 had been negative. At the end of periods varying from one to ten years, 23 of the 29 cases were in good health, and of these 18 had given at first a positive Pirquet reaction. Of the 6 whose health had failed 3 had suffered from pulmonary tuberculosis, 1 from tuberculous caries of the spine, and in 2 cases the condition of the lungs was indefinite, but probably tuberculous. In the 5 cases in which at first the Pirquet reaction had been negative, examination at a later period failed to reveal any signs of tuberculosis. Neuland concludes that in children the prognosis, as regards subsequent tuberculosis, is much better than in adults.

"As for fame and popular applause, they are lighter than a feather, or a bubble, and more vain than the shadow of a dream."—Medical Lectures and Aphorisms—P. 314—1915—Gee. S.—(Ex. Bulletin of Harvey Club, London).

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ON THE RELATIONS OF HEREDITY AND ENVIRONMENT, OF "CONSTITUTION" AND "CONDITION", TO PREDISPOSITION TO DISEASE*

Lewellys F. Barker, M.D., LL.D.

Baltimore, Md.

MEDICAL men in their studies of the origin of disease have, during the past fifty years, been much more deeply interested in external (or exogenous) than in internal (or endogenous) causes. This fact is by no means surprising for we have just passed through a period when studies of harmful agents emanating from without and researches directed toward combating their influences have been extraordinarily rewarding. I need only remind you of the triumphs of modern surgery in overcoming the effects of trauma, and of modern bacteriology, parasitology, immunology and chemotherapy in the control of infectious and parasitic diseases to make clear to you that exopathic considerations have largely dominated medical thought, medical research, and the practical activities of physicians and surgeons of our time.

Through the ages, however, from the time of Hippocrates downward, there have always been medical men, especially among the active practitioners, who have been impressed fully as much with differences in susceptibility to disease, differences in disposition, differences in powers of resistance to external noxæ, and differences in rapidity and completeness of recovery from disease or injury as they have been with differences in the external causes themselves. They have wondered why one of two persons similarly exposed contracted pneumonia while the other did not, why one man developed cirrhosis of the liver though his bibulous comrade who drank as much or more escaped, why one patient died of typhoid and another in the next bed recovered, why a fracture in one person healed quickly and that of another showed delayed union, or why several members of one family were phthisical when all the members of a neighbor's family remained hale and hearty. These discrepancies were not wholly explicable by differences in character of trauma, in virulence of invading micro-organism or in mode of exposure. They could be accounted for only by differences in the persons acted upon, that is to say by differences in disposition, either inherited or acquired. And hence, doubtless, must be sought the explanation of the undying popularity with the profession and with the laity of the conceptions of good and bad or strong and weak "constitutions".

With the rise of the natural sciences and the application of their methods of precision to the solution of medical problems, it was natural that medical investigators should give preference to researches that permitted of exact quantitative measurements. Ideas of constitution and of disposition could not, it was thought, easily be subjected to mensuration as a test of their validity and there was, accordingly, a tendency to put them aside in order to make room for etiological hypotheses more susceptible of mathematically accurate establishment as truth. There was certainly some justification for the harsh comment of Germain See: "La disposition est un mot pour masquer notre ignorance." However, as Bauer has pointed out, the assumption of a constitutional disposition to a disease remained a convenient subterfuge for lack of knowledge only so long as it was adopted solely by exclusion and no scientific proof for it could be brought forward. Once the scientific basis for a doctrine of constitution had been established, the circumstances were altered and consideration of the pathology of constitution and of disposition became both legitimate and imperative. During the past two or three decades, thanks to exact studies of heredity and of development, the scientific foundations for a general and special pathology of constitution and disposition have been laid. Biologists, who during the previous century had concentrated their attention upon the origin of species (doctrine of evolution), have in the present century directed their researches more particularly to the origin of individuals (phenomena of inheritance and development). Through experimental studies of heredity and development in animals and plants they have accumulated data and established principles that mark the beginning of a new era. The knowledge that has been gained of those processes in forms of life below man is full of promise for a better understanding of human heredity and development. It justifies the hope that our ability to control these processes in human beings will from now on make steady growth. It has occurred to me, therefore, that an examination of some of the relationships of heredity and environment to predisposition to disease might afford interesting materials for a general address, such as I have been asked to make on this occasion.

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*Address in Medicine at the Meeting of the Canadian Medical Association in Winnipeg, June, 1922.

The Processes of Development

The development of a human being resembles in all essential respects that of other animals. The laws of heredity and differentiation appear to be fundamentally the same in man as in lower forms. The female sex-cell (ovum) is fertilized by the male sex-cell (spermatozoon). The union of the two sex-cells (gametes) to form a single cell (oosperm) starts a new individual (zygote). Under the influence of a suitable environment, this fertilized egg-cell develops, stage by stage, into an adult human being or person; and as the body develops there is a gradual transformation of the simpler reactions and activities of the oosperm into the extremely complex and varied reactions and activities (exhibited as instincts, habits and intelligence) that characterize maturity. An understanding of the form and functions of the adult can be properly understood only by tracing them back to their origins, paying close attention to each stage of their differentiation from a generalized to a specialized condition. In this differentiation two sets of factors are concerned: (1) intrinsic factors represented by the organization of the oosperm (heredity), and (2) extrinsic factors represented in the surroundings of the developing organism (environment). The development is determined mainly by heredity, though it is modified (stimulated or inhibited) by the environment.

The Nature of Heredity

Knowledge of heredity has made great progress since biologists began to study the traits or constituent characters of organisms singly instead of limiting their attention to resemblances and differences of whole organisms considered as indivisible units. Species characters and racial characters are all inherited; they are firmly fixed by heredity. Many individual characters (structural and functional) are also known to be inherited, though some are due to the environment and are not inherited. All the possibilities for development of body and mind are inherent in the germ-plasm or idioplasm of the oosperm; the possibilities that become realities in the developed person are dependent for their realization upon stimuli originating in the surroundings. The "determination factors" of development are contained within the germ; the "realization factors" of development lie in the environment.

Studies of inheritance by the methods of Mendel have thrown great light upon the transmission of hereditary characters. They have shown (1) that certain characters are inherited as a whole and are not further subdivisible (principle of unit characters), (2) that when contrasting unit characters are present in the two parents, one becomes dominant and the other recessive in the offspring (principle of dominance), and (3) that every single germ-cell is "pure" as regards any given unit character, even though it be derived from a hybrid parent (principle of segregation). Though these so-called Mendelian rules have had to be modified somewhat, their application is apparently as important for biology as the atomic theory has been for chemistry. They have permitted the analysis, by experiment, of the inherited constitution of organisms; by applying them it has been found possible to determine the true resemblances and the true differences of many animals and plants. They probably hold for man, though since man is a slow-breeding polyhybrid, has few children, and is relatively inaccessible to experiment, the study of his inheritance must always be less satisfactory and less accurate than studies of inheritance in lower forms. But there is in man as in animals a cellular basis to heredity, and in man the same distinction between germ-cells and soma-cells can be made. Furthermore, similar chromosomal mechanisms are concerned, the inheritance of certain unit characters is similarly sex-linked, and mutations likewise occur and are inherited. We can feel tolerably certain, therefore, that the general principles of heredity and development that have been and are being established through animal experiment are broadly applicable to man and can safely be used as foundations for medical studies.

Genotype, Paratype and Phenotype; Constitution and Condition

From what has been said, it is clear that we should, by abstraction at least, distinguish sharply in every organism (including man) between the part due to inheritance and the part due to environment. The fertilized egg-cell (oosperm) represents through its chromatin the inheritance uninfluenced by environment. It begins, however, immediately to be influenced by its surroundings (substances and energies) and to undergo changes as a result. If development proceed normally, the reactions between the germ plasm and the environment gradually lead to the fully-developed organism, in man the "realized adult person". To this realized organism the term 'phenotype' has been applied, whereas to the germinal material with all its hereditary peculiarities has been given the name 'idiotype' or 'genotype', since this contains the elements (genes) that determine the reactions that give rise to the characters of the developed organism. Now the genotypic or idiotypic part of a phenotype that is the part due to heredity may well be designated 'constitution', whereas the rest of the phenotype, the part of it due to environmental influences, may well, as Tandler has suggested, be called "condition", or, as Kahn has recommended, "constellation". The phenotype is, thus conceived, the resultant of the interaction of 'constitutional' factors with 'conditional' influences.*

If we adopt these definitions, the conception of "constitution" is purely hereditary in character, It is, as Grote puts it, "the sum of all those morphological, functional and regulatory properties of the soma and of the psyche that are particularly determined at the moment of fertilization and that become realized in the course of personal development." The conception of "condition" is, on the other hand, purely non-hereditary in character. It includes the qualities that are acquired during development and in the course of the personal life (owing to food, geographical location, education, social position, disease, etc.), qualities that are not transmissible to the offspring since they are not represented in the germ-plasm. To repeat, then, according to the above definitions the total qualities of the realized person (phenotype) are partly "constitutional" and partly "conditional" in origin. But if it be desired to use the term "constitution" in a broader sense, we may speak of the phenotype or phenotypic constitution as consisting of two parts:—(1) a genotypic or idiotypic constitution (inherited), and (2) a conditional or paratypic constitution (acquired).

The Clinical Significance of the Conceptions of Constitution and Disposition

We who are clinical workers are daily occupied in the recognition of health and of disease in human beings. We study persons as wholes and we study also their constituent anatomical systems, the functional activities of those systems, and the regulatory mechanisms that control and integrate them. We try to distinguish between what we call "normal" and what we call "abnormal". But the term "normality" has a different meaning, according to the particular standard (norm or type) with which structures and functions are compared. The anthropologist will have one standard in mind, the morphologist another, the physiologist another and the moralist still another. As clinicians, we regard as "normal" a person whose vital responses correspond completely to those biological needs that depend upon his collisions with a physical, chemical, psychical and social environment. When there is incongruity between vital responses and personal needs for biological performances, the person may be regarded as "abnormal". Or if one desire to avoid the terms normal and abnormal he may (with Grote) adopt the expressions "responsive" and "irresponsive" for persons respectively whose reactions correspond, or do not correspond, to their individual biological needs. This idea of "personal normality", or of "responsivity of the person" is clinically of real value, though it differs of course from the notion of normality of type based upon statistics or averages as well as from the notion of normality as identity with an ideal type—two fictive conceptions that, owing to the multifariousness of human differences, are of relatively little value for the clinic.

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*Some contemporary writers use the term 'constitution' in a different way, including in it the whole organismal make-up ("genotypic or idiotypic constitution" plus "condition"), differentiating thus between 'genotypic or idiotypic constitution' (hereditary) and 'conditional or paratypic constitution' (acquired). I have up to now been inclined to reserve the term 'constitution' for the germinal and the term 'condition' for the environmental contributions to the body make-up. Nevertheless the objections raised to such a restriction to the meaning of the term 'constitution' are formidable For we have to deal in reality with developed individuals, composed of cells and tissues and their functions integrated into persons. We can distinguish abstractly, but only with great difficulty practically, between what is inherited (genotypic constitution) and what is acquired (condition or constellation) in such persons. For the qualities of persons are not additions of condition to constitution, they are amalgamations of inherited and acquired. Thus vaccination gives an acquired immunity against smallpox but this acquisition presupposes a definite inherited constitution!

Considerable "variation" (morphological, functional, regulatory) in human beings is compatible with health, though each variation may entail some special individual predisposition to disease, since the variation may limit the powers of adaptation to the environment. The study of 'personal variants' becomes therefore of great importance, for an acquaintance with these and their corresponding dispositions to disease will be essential for the development of methods of special as contrasted with general prophylaxis. Morphological personal variants (exhibited as differences in habitus), functional personal variants (manifested as differences in biochemical composition or differences in modes of reaction) and evolutive and involutive personal variants (characterized by differences in times of reaching the developmental acme or in times of appearance of the phenomena of senescence) must always interest clinical workers who study single persons in the search for clues for disposition to disease and for criteria that will serve as guides for preventive intervention. A morphological variant exhibiting an asthenic habitus is believed to be, other things being equal, more susceptible than others to pulmonary tuberculosis, a functional variant who metabolizes or eliminates purins slowly is in danger of paroxysms of gout; an evolutive variant who carries his infantile or adolescent modes of reaction and adaptation into adulthood runs the risk of psychoneurotic failure of social adaptation; and an involutive variant who shows a premature canities, an early arcus senilis of the cornea, or a premature menopause may, a little later on, show other signs of a partial or universal senilism or become the subject of a pathological abiotrophy, a progressive atherosclerosis or a chronic hypertrophic osteoarthritis.

So long, however, as these personal variants are adequately responsive, we do not call them 'diseased'. We clinically designate a condition as disease when the person becomes irresponsive, that is to say when his powers of adaptation become incongruous with his personal needs in the way of functional performance and endurance.*

The revival of the study of constitution emphasizes the individuality of each patient. It takes especially into account the structural and functional differences that distinguish persons from one another. No two persons are precisely alike. Each human being is a unique person; no-one just like him ever existed before; nor will anyone just like him ever exist again. The student of the pathology of constitution will ask himself when he studies a patient: Why does this particular person sicken of this disease? Why does the disease in him follow this particular course? Such questions are in line with a laudable clinical tendency, that of individualization in both diagnosis and therapy.

Disposition to disease in a given person may depend upon abnormalities of the genotype or idiotype chiefly, upon abnormalities of the paratype chiefly, or upon a combination of both. The example usually chosen for illustration is pulmonary tuberculosis. From the standpoint of *inherited constitutional or genotypic disposition*, a person with a long, narrow thorax and voluminous lungs (habitus asthenicus) is believed to be much more liable, other things being equal, to progressive pulmonary tuberculosis than is a man with short neck and thorax and small lungs (habitus apoplecticus). From the standpoint of *non-inherited conditional or paratypic disposition*, a person who has recently recovered from measles or whooping cough is, other things being equal in greater danger of pulmonary tuberculosis than is another. A person with asthenic habitus convalescent from measles has a *combined genotypic and paratypic disposition* to pulmonary tuberculosis, partly inherited, partly acquired, and is, accordingly, doubly endangered.

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*Though this definition of "disease" is practically useful in clinical work, a widening of the meaning may be desirable for anthropology and for general biology.

A growing interest has been manifested since the beginning of the new century in the analysis and classification of human phenotypes. French observers have attempted to divide developed human types into four main groups: (1) a respiratory type, (2) a digestive type (3) a muscular type and (4) a cerebral type, on the ground of external habitus. Clinicians in various countries have described several types of general anomalies of phenotype, for example, the status asthenicus (Stiller), the status thymico-lymphaticus (Paltauf), the status hypoplasticus (Bartel), the status exudativus (Czerny), the status arthriticus (*arthritisme* or *herpetisme* of French writers). Such general anomalies of body make-up are believed to predispose to special forms of organic and functional diseases. Interesting as these attempts to establish definite types of anomalies of constitution are, they are far from exact scientific establishment. The several anomalies mentioned show manifold overlappings; it would seem as though every new investigator in this domain felt it incumbent upon him to describe a new 'status' under a new name, even though it appeared as only a slight modification of a status that had been earlier described. As J. Bauer has emphasized, the objection to be raised to these attempts at systematization of "states" lies in the fact that clinically so many mixtures of the "states" are seen and in such kaleidoscopic confusion that, for the present at least, they defy attempts at satisfactory classification. The reason I think is obvious. Clinicians have been trying to deal with complex wholes of constitution before knowledge of the simpler elements has sufficiently advanced. Clinical studies of the pathology of constitution and disposition are suffering from the limitations that characterized the studies of heredity by biologists before the application of the experimental analytical (especially the Mendelian) method.

Following the lead of modern biology in the attempt to deal with the inheritance of constituent characters rather than with that of organisms in their entirety, Davenport and Plate have catalogued over sixty pathological human traits that they believe to be inherited in Mendelian fashion. Some of these appear to be dominant, some of them recessive. A number of them, like hemophilia and color blindness, seem to be sex-linked. Though only a beginning has as yet been made in the scientific analysis of phenotypes (and of their genotypic and paratypic constituents) in relation to disposition to disease, it is certain, I think, that studies of this sort must soon increase in numbers and in clinical importance. An especially fruitful field is that of dispositions depending upon disorders of the endocrine functions, both those of genotypic and those of paratypic origin.

There can be no doubt that, as knowledge of constitution and of disease disposition grows, much will be gained for prophylaxis, therapy in general will become more individualized and, perhaps, we shall also make some advance in devising practical eugenic measures that will lead gradually to the betterment of our race.

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SOME PHASES OF DYSTHYROIDISM*

C. P. HOWARD, A.B., M.D.

Iowa City, Iowa

WITH the introduction of the newer laboratory methods for the study of diseases of the thyroid gland, a new impetus to investigation has been introduced into this fascinating field. Yet we fear that these laboratory methods have a distinct tendency to outweigh the clinical history and physical findings and thereby to prejudice the physician's conception of the underlying pathology of the disease. It must be a common experience for the physician, who has referred to the metabolic station a patient with a suspicious history of thyroid disease to receive a report of a normal basal rate. He is too apt to accept this report as final evidence against his well founded clinical diagnosis. The question naturally arises is such an attitude of mind justifiable? Are we to accept, as axiomatic that a normal basal rate means that the symptoms of the case under investigation are not due to thyroid intoxication? All of you, I think, will agree that the very most a normal basal rate can signify is an absence of a marked thyroid toxicity. Plummer and Boothby, I believe, insist that the term "hyperthyroidism" implies necessarily an increased metabolic rate, and that conversely a normal rate excludes hyperthyroidism. It has been generally accepted for some time that the disease known as exophthalmic goitre is due to hyperthyroidism, *i. e.*, an excessive excretion of normal thyroid hormone. Accordingly, in this disease the increase in metabolic rate, as is usually found, has been assigned to this excessive excretion. Even if this latter contention be true, is it necessary to suppose that such an excessive secretion is present in the early states of the disease or indeed present in measurable amounts at all times during the fully developed stage? In other words one may ask is the basal rate to be the sole criterion of the absence or presence of a disordered function of the thyroid gland? Some of us believe that this is too much to expect of any "method of precision", as the basal rate measurement purports to be, and we accordingly would depend rather on the clinical history and physical examination in an obscure case than upon any *one* laboratory method, valuable as that method may be in the majority of instances.

If it were merely a matter of terminology as some would suggest, we might speak of thyroid disease with a high rate as hyperthyroidism, thyroid disease with a normal rate as dysthyroidism, and thyroid disease with a low rate as hypothyroidism We, however, would be even more radical and adopt the suggestions of Janney and Cushing to discard the term "hyperthyroidism" as a synonym of Graves disease in favour of "dysthyroidism", even when speaking of the fully developed stage of Graves disease. The reasons for this change of terminology we have outlined elsewhere. (1) Whether this suggestion be acceptable to all of you or not, we are not ready to admit that the classification of cases of thyroid disease with normal rates as "dysthyroidism" permits one to regard this group as essentially different from those with a high rate. By which attitude of mind we do not intend to be obstinately academic, but to assert our belief that an increased basal rate signifies merely a more marked degree of toxicity (hence more measurable by one method of laboratory examination) of the same underlying toxæmia, and not a different disease entity.

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*Read at the annual meeting of the Canadian Medical Association, Winnipeg, June 23rd, 1922

Perhaps we can make our attitude clearer by now reporting a group of twelve patients which has been studied during a period of twelve months in a medical clinic with the usual high incidence of toxic adenomata and Graves disease that obtains in the middle west.

When I submitted this subject last March to your president I was not familiar with two of Goetschs papers (2) on an analogous group, nor had I heard Dr. J. L. Miller's paper (3) before the Association of American Physicians, nor read Hamilton and Lahey's article (4) which has just appeared. Our study of this particular group has been going on for the past year or two synchronously with those of the above mentioned writers; but what is of especial interest the clinical pictures depicted in all four papers is so similar as to suggest that there is a modicum of truth in our conclusions.

To describe this group in detail is surprisingly easy. First as to sex incidence nine of our twelve patients were females, a ratio nearly identical with that of exophthalmic goitre in the hospitals of America. (1)

Secondly, the average age of the group was twenty-eight years and two months with a range of from seventeen to forty years—an average age not much below that of exophthalmic goitre. The slight difference between the two groups, is due, we believe, to the fact that we are dealing with the earliest manifestations of thyroid intoxication.

The third point that we would emphasize is that six of the series had long been treated for pulmonary tuberculosis and had spent some months at least in the state sanitarium. Of the others, three were sent to us with the diagnosis of neurasthenia, one as colitis, another as "goitre" and one as "hyperthyroidism".

When we turn to the family history, we find in none a history of neurasthenia or other functional nervous disease. Three, however, had relatives with goitre, while a fourth patient had a father with Graves disease. In five families tuberculosis had occurred, but in only one was a sister or other member of the present generation affected.

Probably the most striking thing in the history of the present illness was that in all twelve cases the onset was sudden and definite; in most instances an exact date was volunteered, and in practically all the actual month was specified when the symptoms were first noted. This sharpness of the onset is also emphasized by Hamilton and Lahey, who contrast it with the vagueness of the onset of neurasthenia and allied states.

The duration of the symptoms varied from one month to five years with an average for the group of two years and one month. In other words the syndrome is not, by any means, transitory. The symptoms of the entire group are strikingly characteristic of disturbances of the autonomic nervous system. Under this heading we would include all symptoms due to an abnormal stimulation of smooth muscle, heart muscle and the secretory glands.

In this particular syndrome the ocular symptoms are decidedly in abeyance, as in only one patient was a slight degree of unilateral exophthalmos present, although in five Joffroy's sign and in three Stellwag's phenomenon were noted.

In marked contrast was the constancy with which sweating, palpitation of the heart, dyspnœa, hoarseness, nervousness, weakness, fatigability, emotional instability, insomnia, præcordial or abdominal pain, anorexia and even occasionally vomiting, diarrhœa, nocturia and pollakiuria, were mentioned in the anamnesis. Five of the eight women complained of varying degrees of dysmenorrhœa.

Upon physical examination there was evidence of loss of weight in all but one patient, the amount ranging from three to forty pounds, an average of roughly fifteen pounds for eleven of the group. In only one case was the weight stationary.

The thyroid gland in every patient was considered as slightly enlarged, though careful palpation was sometimes necessary to determine this slight grade of hypertrophy. The consistency of the gland was usually firm and its surface smooth; once only was the surface noted as granular. The thrill and bruit, so characteristic of the thyroid of Graves disease, were both noted on one examination in three cases, but were absent on another; in one case the bruit only was detected. In the two patients in which the gland was examined at operation the surgeon noted that the peri-glandular tissues were firm and adherent to the gland capsule, while the colour of the gland itself was whiter than normal; in one case it seemed unduly vascular. It is only fair to state that both these glands had been submitted to one or more courses of X-ray therapy.

The characteristic fibrillary tremor was present to a marked degree in all but one patient, and in the latter was equivocal. In addition in several there was a coarse tremor resembling that seen in chronic alcoholism.

The skin was invariably fine, satiny, moist and exhibited varying degrees of dermatographia, flushing and transitory erythemata—in short all the signs of a vasomotor instability.

The pulse was very labile, ranging from the normal to 100, 110 or even 120 beats per minute. This tachycardia, though usually occurring after physical exertion, was just as likely to appear upon emotional stimulation. The temperature too, showed invariably slight elevation, though by mouth it was never recorded above 100° F.

The blood pressure revealed a slight increase in the systolic phase in fifty percent. of the group; the diastolic pressure was usually normal or a little below. In other words, there was no marked change in the pulse pressure.

The blood count was normal as far as the hæmoglobin and red cells were concerned, but a leucopenia was common and in eleven cases there was a relative lymphocytosis ranging from 27% to 46%, highly suggestive of the picture found in the fully developed stage of Graves disease.

We think the above description of the clinical picture would justify an expectation of an abnormal basal rate, yet this expectation was far from being realized and it is largely on account of this negative report that we are drawing your attention to this clinical syndrome. Seven of the patients revealed rates within the normal figures of −10 and +10%; two cases with only one reading (apart from the usual trial one) read +11 and +15%; figures nevertheless distinctly below our expectations, though it is true just above the normal. Two other patients gave a slight increase (+11 and +15%) on one reading and normal rates on another occasion. The twelfth case on the first reading gave the distinctly high figure of +31.8%, but three weeks later and again three months later it was well within normal limits (+1.8%) though the symptoms were only slightly ameliorated.

It seemed to us evident, therefore, that with patients whose symptomatology of a disturbed autonomic system were so pronounced, and whose B.M.R. was so consistently below expectations, some other laboratory diagnostic measure must be relied upon for support.

Accordingly, recalling the constancy with which the carbohydrate metabolism is disturbed in exophthalmic goitre, we tested the sugar tolerance in ten of our series. The usual method was followed, and it is not necessary to describe it here. Five or 50% of our cases showed both an alimentary hyperglycæmia and glycosuria; while one other showed a distinct hyperglycæmia, but no glycosuria. Three were negative for both hyperglycæmia and glycosuria. In other words, this test was positive in a much higher proportion of cases than was an increase of the metabolic rate.

Finally we tried the susceptibility of five of our patients to the subcutaneous administration of adrenalin. This test is considered by Goetsch (1) to be present in all cases of so-called hyperthyroidism though not necessarily pathognomonic of the disease, being merely an indication of hypersensitiveness of the sympathetic nervous system. Be this as it may, it was positive in varying degrees in all five of our cases, but in one of these was decidedly atypical. One of the patients (whose B.M.R. was −3.5%) gave a very typical reaction in all respects and developed glycosuria which was present for several hours.

Unfortunately, we had not commenced the Kottmann test (5) until April, 1922, so that only two of our cases have been submitted to this laboratory test, one being positive, though the rate was only −4.5 to +1.3%, and the other negative with a rate of −9%. This test depending as it does upon the physical-chemical activity of some theoretical colloidal substance in the serum of the dysthyroid patient, may prove of considerable value in the diagnosis of this border line group.

Differential Diagnosis: We feel that such terms as psychasthenia, neurasthenia, neurocirculatory asthenia and cardiac neurosis will not suffice to describe this group of cases. Some of them may belong to the disease picture described by Goetsch under the name "diffuse adenomatosis of the thyroid gland". By this he means a syndrome closely resembling our picture, but in which thyroidectomy has been followed by a very definite improvement. Further, the thyroid gland presents a definite, and at times a very marked increase in the interstitial tissue, together with increased amounts of lymphoid tissue and an associated hypoplasia of the primary alveolar or acinar epithelium. The interstitial tissue is not aggregated into nodules, but is scattered diffusely throughout the gland. While this pathological picture yet lacks confirmation, as far as I know, (and unfortunately we ourselves have not had the temerity to advise thyroidectomy in our cases) it sounds plausible and very attractive, coming as it does from such a careful student of the thyropathies.

Some clinicians might assign this symptom-complex to a hyperadrenalism or hyperchromaffinism. Of course we must agree with Barker (6) that "there is some evidence to support the view that certain cases of tachycardia with tremor and without struma are sympathicotonic states due to hyperchromaffinopathy rather than to hyperthyroidism." With Hurst, (7) we are also in accord when he writes that "many of the so-called *formes frustes* of Graves disease—emotional patients with tachycardia, vasomotor instability, excessive sweating and tremor, but without any marked enlargement of the thyroid or exophthalmos, and some cases of so-called idiopathic hypertension in nervous individuals are probably of this nature—*viz.* functional hyperadrenalism—hyperthyroidism."

We reluctantly admit, therefore, that some of our patients might be classified under this theoretical heading, but because of the prompt response to well recognized thyroid management in two at least, we cannot concede that this terminology will embrace the entire group.

Treatment has been limited to ligation of the superior thyroid arteries in two cases with marked symptomatic improvement in both and a gain of twelve and fifteen pounds, respectively, in six months time. One of these patients has returned to her nursing profession on part time. In the future we shall unhesitatingly urge a partial lobectomy as the procedure of choice.

In five other cases radiation with the roentgen ray or radium gave less distinct but still definite improvement. Five other cases either refused to stay for treatment or were discharged on some placebo, with the hope that they will return at some future time for further study and observation.

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Hypofunction and Hyperfunction of the Ductless Glands.—No single phase of endocrine dysfunction, A. J. Carlson, Chicago, asserts, is satisfactorily worked out today, either clinically or experimentally. He presents the established facts and what appear to be obstacles to progress—baseless speculation and uncritical practice. The credit for progress made and the blame for errors committed are shared by the clinical and laboratory groups. Failure to recognize the complexity of every endocrine problem is a serious obstacle to victory. Following the hormone theory alone may, in the case of some of the ductless glands, lead way off the main road. Carlson believes that much of the glandular therapy of today, however harmless to the patient, injures the good name of the medical profession with intelligent laymen. Carlson says: "We cannot practice quack methods and escape the just censure of society. The quack diagnoses every ailment with ease, and offers remedies for every disease with assurance. The good physician knows that he is neither omniscient nor omnipotent in the field of disease; and the educated layman knows this as well as the physician. Then, why pretend? Bluff may succeed for a time, but honesty is better for society; and what is best for society is best for the medical profession."—*Jour. Am. Med. Associa.,* July 8th, 1922.

THE STUDY OF SYMPTOMS

Thomas McCrae, M.D., F.R.C.P.

Professor of Medicine, Jefferson Medical College, Philadelphia

EVERY art tends to be destroyed by the machinery which it creates; the tools of the trade may become more important than the trade itself. There is no lack of examples and perhaps our legal friends would agree that it often seems as if the machinery and procedure of the law have come to mean more than the basic principles of justice. Medicine is no exception and it seems worth while considering whether we are not in danger of making more of the machinery than of the art itself. It is a commonplace to dwell on the increasing complexity of medicine and to point out the difficulty of keeping up with all the advances. For the majority of us who have dates of the last century on our diplomas there is difficulty in understanding some of the work published to-day. The youngsters speak a language which we have not learned and perhaps, for our comfort be it said, this has been true of many previous generations.

For the majority of the profession the chief object is to care for the sick and to prevent disease. Naturally we desire to have every aid in doing this and many of these are complicated, requiring special training and elaborate apparatus; witness the Wassermann reaction and the electrocardiograph. But why should we stand in such particular reverence before them? They may be of the greatest assistance and a proper diagnosis may be impossible without them, but they should be used and kept in their place. An example of the placing of the Wassermann reaction in a position which it is not worthy to occupy was seen in the case of a patient with clear signs of syphilis of the liver who was left without treatment because his Wassermann reaction was negative. From the electrocardiograph we have gained material aid, but much of the knowledge obtained from it we can apply at the bedside by the use of our own senses.

It is a constant struggle for teachers to keep their students from making more of the machinery than of the art, and there is a certain type of student who, when asked, for example, the diagnostic points of some thoracic disease, answers first that an x-ray examination should be made. This may be necessary and may be the last court of appeal, but that is no reason why the usual methods of examination should not be carried through first.

One unfortunate result of this habit of mind is that the individual's own powers of observation and reflection atrophy through disuse. Trusting to a mechanical or laboratory method brings its punishment—the individual can do no other. Perhaps the statement that the powers have atrophied through disuse is not always correct—they may never have been present. If this is the case it may be difficult to do much, but for the majority the matter is largely one of training and here the teachers of medicine have a heavy responsibility. It is both an active stimulus and at the same time a sobering responsibility to think that the example and methods of a teacher have such a wide-reaching influence. How far away from the proper use of their own powers of investigation men may travel was brought home to me on a recent examination of the National Board in which I was acting as one of the examiners in clinical medicine. Four men in their examination of a patient's circulatory system, began by listening to the heart with their stethoscopes. In their discussion of the patients it came out that these men were all able to interpret correctly abnormal electrocardiographic tracings, but not one was able to examine a heart properly. For these men the machinery was more important than the heart itself.

In clinical medicine we have many diverse problems, some easy and some difficult. Wherein are we most apt to fail? It is easy to understand that any of us may be puzzled by some obscure rare case, of which we have never seen an example. Such must always occur, but I wish rather to dwell on the errors made in what may be regarded as comparatively simple diagnosis. It has been interesting to find what common condition has been most frequently overlooked in patients seen in consultation. It is the presence of fluid in the pleural cavity and you may well ask why this should be. The answer lies partly in the frailty of human nature, for it is rarely due to lack of knowledge. This is a condition in which the use of our own senses and brains is all that is necessary—occasionally the help of a needle may be required, but very rarely —and an x-ray examination should be a necessity only in a very exceptional case. Here if we depended on our own faculties and used them there should be few errors. You do not need to be reminded of the saying that "more mistakes are made by not seeing than by not knowing."

We all agree that thoroughness and efficiency in our every day work are to be striven for in every way—not only for the good of the patient but for the sake of our own development and the reputation of the profession. Careless work harms all of them. How are we to reduce it? You may throw the burden largely on the training given to students and so on the teachers and properly to some extent. If a student has not been taught proper methods it is difficult for the majority to acquire them afterwards. I am willing to accept the responsibility of the teacher, but never forget that he has to deal with diverse material and has always the problem of deciding whether he will give attention to the better or poorer students in his groups. It is not an easy decision.

This brings me to the subject of my address—"The Study of Symptoms."* If we are to improve our efficiency in caring for the sick we must endeavour constantly to improve our ability to recognize what we have to do. In some quarters if one insists that accurate diagnosis must go before proper treatment he is termed a therapeutic nihilist. In which class—if that be the qualifying condition—most of us would be proud to place ourselves.

My feeling is that one very important thing for the profession to-day is to make the effort to get back to fundamentals. After all the essential things do not change. Proper methods and thoroughness are as important to-day as they were fifty years ago and as they will be fifty years in the future. The great majority of diagnoses have to depend principally on the proper use of our own faculties. Much of what comes to us as raw material to be fashioned into a correct diagnosis is in the form of the patient's account of his symptoms. This brings one naturally to the problem of obtaining these symptoms. It is very evident that there can be no complete study of symptoms until they have been obtained, so that if we expect to use them properly we must first obtain them to work on. This has to do largely with the question of the history.

How can we ensure the best stock of material to work with? This is not intended as a discourse on history taking but some words on it may not be amiss. How many of us take a better history to-day than we did a year ago? This should always be our aim. Three things stand out, patience, thoroughness and system. With this goes a training in examination and cross-examination as thorough as any lawyer should have. Naturally we do not have a hostile witness as a rule. I have sometimes thought when listening to a lawyer examining a witness that he might have been more skilful if he had taken some medical histories. Patience is required, for we know how garrulous and how stupid many patients are. Thoroughness and order are necessary that no point may be missed. It is always embarrassing for a consultant to elicit some point in the history which the man in charge has missed. To his indignant comment "You never told me that," comes usually the answer, "You never asked me." System means as much as anything in our work generally. The enquiries have to take in every possibility so that none may be missed.

It is a constant exercise in one's powers of adaptation and knowledge of human nature to suit the method of history taking to the individual. In this connection I often think of Alan Breck in Stevenson's *David Balfour*, and his handling of people. You will remember how he discussed various ailments with the auld wife, of whose discourse on symptoms Stevenson says: "Sometimes it was merely dull, sometimes both dull and awful, for she talked with unction." Later came the admonition from Alan to David: "What does your auld wife mind now? A fine, canty, friendly, cracky man that suffered with the stomach, poor body, and was real taen up about the good brother. O, man David, try and learn to have some kind of intelligence." The last sentence might be applied to all of us in our history taking.

One thing which always impresses me is to have several men take the history of the same patient at different times so that each man is doing it without knowing what the other has obtained. It is an interesting study to compare the results and surprising how much difference very frequently is found. There is no doubt that at times the taking of the history seems more or less of a bore, and something which is to be got through with as quickly as possible. To my mind the one who does this loses much, not only in handicapping himself in making a proper diagnosis but in missing a great part of what should be a most interesting process. In this we are studying what may be the most important symptom of all—the patient himself. The history should include that of the patient himself as well as that of his disease. The importance of this needs no emphasis, and it should be kept in mind with reference to some of the forms of "group medicine" which have become so popular. In some of these apparently no one individual really establishes personal relationship with the patient: no one studies him as a personality. The reports from some of them give abundant evidence of this. Remove the personal relationship and you no longer practise an art; you drive a trade.

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*The term symptom is used with various meanings but here it is employed in the sense of the complaint made by the patient, as opposed to the objective findings.

Much has been written by lawyers regarding examination and cross-examination, and while of course this is more spectacular when done in open court, each one of us has the opportunity to show his ability with every patient interviewed. The more stupid the patient and the more difficult it is to get a connected history, the more we should pride ourselves on obtaining the best possible result. It is never safe to allow one's attention to relax even when the most garrulous patient or one of his family is holding forth, because one never knows when an essential point may be brought out. Some little remark may give the key to the whole situation, as seen in the case of a patient who had an extremely talkative wife from whom words poured in an endless stream. She happened to let fall a chance remark regarding a curious habit which her husband had when in bed of having the bed clothes turned up at the bottom so that his feet were exposed. She mentioned it as a joke on him but this remark gave the clue to an otherwise difficult diagnosis.

The art of diagnosis represents the solving of a problem, and this should always be of interest. What seems the most simple case may contain unsuspected difficulties, and the good rule of distrusting the obvious should always be before us. Naturally we wish to improve our abilities in diagnosis, and in this it is an advantage to approach each patient as representing an unsolved problem in which our powers are set against the unknown. It should be regarded as an intellectual problem much more often than it is. If to the routine of the day's work the intelligent curiosity of interest can be added much is gained.

There is one interesting exercise which may be carried on during the taking of the history—the noting of possible diagnosis. As one goes on this or that diagnosis comes as a possibility and can be put on a mental list. It is a good training in the value of symptoms to check these up later with the findings. It is evident that if ten possibilities are suggested during the history taking there is less chance of overlooking the condition present that if only five possibilities occur. Not that this supports the making of a diagnosis from the history. There is a pernicious habit which has been too evident in some quarters and is one to be strongly criticized. It is easy to regard a history as diagnostic of a given condition but not conducive to accurate diagnosis. There are, of course, some conditions which give a symptom picture which is almost distinctive, but this should always be verified. It is especially common to describe certain combinations of symptoms referred to the digestive tract as characteristic of this or that disease, but therein lies considerable danger and doubtless we have all seen instances of the possibilities of error in this. The reason probably is that many of the symptoms are really due to disturbance of the sympathetic system which may be inaugurated from many different areas. Take gastric hyper-acidity, for example, which was thought years ago to be characterized by a fairly definite symptom picture. We have learned the error of this and in addition, largely through the labors of certain of my colleagues, that many of our ideas as to supposed hyper-acidity figures and their relation to abnormal conditions were absolutely wrong.

Let us discuss some of the particular problems connected with symptoms, but first may I digress for a moment to discuss one of my hobbies—the proper use of words? We should be careful not to accept terms given by a patient which have a variety of meanings, such as "rheumatism," "neuritis," "bilious," etc. An exact statement should be obtained of what is meant. What the patient means by "rheumatism" and what you understand him to mean may be far apart. The lay idea of anatomy is often very hazy and the statement from a patient that he has pain "around the heart," for example, should never be accepted. He should be made to show where the pain actually is situated. Our use of the word *functional* should also be definite, as it is employed in very different ways. We speak of a functional nervous condition and of a functional disturbance of the heart. In the former case we clearly exclude organic disease, while in the second case a functional disturbance may be associated with and due to organic changes. It is certainly difficult to do away with this confusion, but we should be clear in our minds as to the significance we give the word. In one sense we may say that disturbance of function is what brings the patient to us and our diagnosis is a search for its cause.

Of the handicaps to proper ideas of disease which we give ourselves by using careless and unjustified terms there are many examples. Those old frauds "too much uric acid" and "acid in the blood" have gone out of use very largely, but there are others which sometimes even yet appear to have some standing. "Intestinal auto-intoxication" has to a large extent lost its vogue, but it is still heard too frequently. A careful study of symptoms and the causes that produce them should soon lead to the disappearance of this incorrect and misleading term, the symptoms attributed to the supposed condition being due to various causes, such as infection, disturbances of motility, an irritable colon, and derangement of the sympathetic nervous system.

Study of the Sympathetic System. Let me emphasize the need of a thorough knowledge of this if one is to explain many symptoms, especially those connected with the gastro-intestinal tract. Many of what we ordinarily designate as symptoms of disease of some organ are due to an associated sympathetic system disturbance. Witness many of the symptoms resulting from disturbed function of the thyroid gland. In the gastro-intestinal tract the influence of the visceral nervous system is always in evidence and many symptoms are obscure unless this is kept in mind and understood. In this the parasympathetic portion (the extended vagus) plays the largest part. For example, many of the symptoms which we associate with gastric ulcer are really due to vagus disturbance. Many years ago I remember a wise old physician saying to me: "My standby in digestive disturbance is bromide and belladonna. It is always safe to make a trial of them anyway." The reason for this practice is evident when we remember the sympathetic system.

Take some of the common symptoms of derangement of the digestive tract. How many individuals begin the day by a careful inspection of the tongue with an epicure-like study of the taste in the mouth and are elated or depressed by the results. In many cases a coated tongue is due to reversed peristalsis and particles from the colon may readily reach the tongue, explaining sometimes the unpleasant taste so graphically described by Mulvaney in "Soldiers Three." In this same way nausea is probably more often due to disturbance in the colon than in the stomach. Reversed peristalsis is responsible for many of these derangements. Vomiting, regurgitation, belching, a foul breath are frequently due to it. If we are to get at the essential cause of these disturbances we must be willing to expend more than a perfunctory study in their investigation.

Pain. Naturally this stands out as the chief among symptoms, but it is conducive to clinical humility to realize how very little we really know about it. Study the next ten patients who come to see you complaining of pain and find out in how many you can give a *complete* explanation of its causation. A "catchword" explanation will not do, but that is what we are satisfied with in the majority of cases. Try to explain the exact cause and mechanism of the next half dozen cases of headache and see what success you have. I doubt if there is anything more helpful in our education than a thorough study of the explanation of pain, and we cannot fail as years go by to increase our ability to determine the cause if we study it at all. Obviously only a few of its many aspects can be discussed here and these briefly. Our discussion at present need be only with the more obscure causes of pain.

In the study of the cause of pain there are many methods employed. One deserves more attention than is usually given to it—the putting down of all the possible anatomical sources and the various headings under each one. Take the common complaint of pain in the back, often so obscure. If we make a list of all the possibilities it is a long one, but the main headings are few and can usually be excluded or proved, and with each of these goes several sub-heads, so that finally there are few left to consider. In this connection reference may be made to one condition which, curiously enough, has received very little attention on this continent, namely, fibrositis. Many of the apparently obscure pains, often designated "neuritis," "muscular rheumatism," etc., are due to this. It is extremely common, is responsible for much minor disability and is usually due to infection somewhere. If more attention was paid to its recognition certain of the cults would fall on harder days.

Referred Pain. We have to recognize that the situation of pain and the seat of the diseased process causing it may be far apart. This sounds elementary and it is, but that it requires reiteration is proved by the number of patients with tabes and spondylitis who have the abdomen opened on account of referred pain. This is one of the most interesting fields of work in medicine and it is difficult to think of a more satisfactory exercise, intellectual and diagnostic, than to work out the cause of an obscure referred pain. Let us take the prostate gland as an example. Disease of this organ may give many symptoms, but the referred pains are most interesting. In one patient renal colic is accurately simulated, in another the symptom of sciatica, in another pain is felt in the lower back. A study of the anatomy and a knowledge of physiology go far to solve the problem, but they do explain why in one patient the referred pain goes along one path and in another chooses another route.

No problem is more complex than that involved in studying the explanation of pain referred to the region of the heart. Here again let me emphasize the need of accurate description as to the exact seat of the pain or discomfort. This is particularly important in deciding whether the aorta or heart is concerned. Pain or discomfort referred to the precordium is a common symptom; we all know the difficulty in interpreting its cause and significance. To discuss the problem fully at this time is not possible and reference can be made only to a few points. Emphasis should be placed on the value of the study of the *viscero-sensory reflexes.* We have here a most useful means of investigation which for some reason does not receive the attention which it should. It has never "caught on," so to say, and I put in a plea for its more extended use. It requires some knowledge of anatomy and physiology, but this can be acquired in a short time and the dividends are large. I need not remind you how often Sir James MacKenzie has emphasized this point and laid stress on the value of the work that may be done by the general practitioner in a study of a patient over a period of years. He points out that the way is not easy and every one who has tried to travel it will agree. For example a patient comes complaining of disturbed sensations in the region of the heart. No signs of organic disease of the heart are found, the organ is doing its work properly but there is sensory disturbance, and a study of sensation shows areas of hyperæsthesia. With improvement in the general condition the discomfort disappears and the patient a year later is found to have lost the sensory disturbances. Another similar patient may make as good a symptomatic recovery, but examination shows the objective sensory features unchanged. In a patient recently seen this was the case after an interval of three years. How are we to regard these patients? Both are subjectively free of their symptoms, one is free of the objective findings, the other has them, not subjectively but only objectively. Here is one of the problems which further study is required to settle.

This question of pain in the left thorax particularly has much to do with the interpretation of what is angina pectoris. A patient comes with suspicious symptoms, and for his sake and our reputation an exact diagnosis is most important. We all know how difficult this may be and how much depends on a correct conclusion. Here a careful study of the symptoms and their interpretation does much to make a dark problem clear, particularly in separating aortic and cardiac sources. Not that the problem is always soluble, for if you study the discussion of pain in angina pectoris in Sir Clifford Allbutt's work it is evident that the question is not by any means an easy one to decide. My own feeling is that his explanation of the pain of angina pectoris as originating in disease of the first part of the aorta has much in its favor.

Then there is the pain referred to the region of the heart in the neurotics and those who have neuro-circulatory asthenia. We may say a hypersensitive nervous system—which is perhaps satisfying but really not conclusive. There are some remarkable problems in this field, and the explanation of the pain may be beyond us. Take, for example, the occurrence of attacks in males which mimic angina pectoris, and are apparently associated with disease of the prostate or deep urethra, disappearing after correction of the local disease. The group of patients who suffer from some disturbance in the sexual sphere and have associated cardiac pain is a large one. The explanation of the mechanism is difficult.

The complaint of *abnormal sensations* is a common one and it is easy to dismiss them as "functional" but this is not a diagnosis. Natually these are especially important is diseases of the nervous system. They are sometimes of the greatest value, as, for example, in the early diagnosis of pernicious anemia. It does not do to dismiss them lightly; they have some meaning and it is our duty to find it. Take the curious muscular cramps, often nocturnal, usually in the muscles of the legs, which so torment some patients. How do we explain the common numbness and tingling of the hands so often complained of about the time of the menopause? We sometimes find an explanation for these and many others, but more often we are unaware of the mechanism. There is no lack of problems to be solved.

This address has dealt with simple things which are the most important ones in medicine, as in life generally. Those of us who have been on committees and such bodies, the number of which is a perfect plague in the lives of many of us, know how often one member seems to be able to get down to the fundamentals of some difficult question, so that when he has had his say, the matter seems clear. In medicine, many of the problems have to be settled by a committee of one—yourself. The more you can get to the simple underlying facts the easier to solve the problem. Let us endeavour to do this in our daily work, realizing that most of our problems have to be settled by our own senses and our own brains. I am not disparaging the help from other sources, often essential, but let us be sure that it is essential before we call for it. Let us try to train and develop our own powers by using them.

The material which we first receive to use in the making of a diagnosis is in the form of symptoms. Without them we are greatly handicapped. Let us train ourselves to obtain them thoroughly and then use them wisely. A good diagnostic sermon might be preached on this as a text—"Which symptoms are important." We are often confused by the multitude of complaints, and I have sometimes wondered if the diagnostic skill of some men was not greatly due to their ability to choose what was essential. It is in the power of all of us to increase our ability in this direction if we are careful to study symptoms thoroughly. It is not spectacular, it requires time and patience, but it is well worth the effort.

Then emphasis may be placed on the delight of the process as an intellectual problem. To have joy and interest in one's daily work makes for happiness, and what profession can equal ours in the possibilities of this. To solve an intricate chess problem or a clever detective story is a pleasure, but we have just as interesting problems every day. Even as an intellectual pursuit it is worth while, not to mention the satisfaction of thorough work and the benefit to the patient.

That many of the problems related to symptoms are still unsolved should be a stimulus to us to do our part to make them clear. We need not expect to do this in a day, but if everything was cut and dried where would much of the satisfaction of practicing medicine be? There are few greater satisfactions than to solve a difficult problem. In this the thorough study of symptoms takes no mean place in the equipment of our work. All the problems will not be solved in our day, but we can take satisfaction in the thought—

> For at our heels a fresh perfection treads
> Born of us; fated to excel us.

Treatment of Enuresis.—De Haan presents convincing arguments that the main cause of enuresis is the exceptionally profound sleep. The slumber is so deep that it is below the threshold for the normal rousing reflex for evacuation of the bladder. There is some neuropathic factor involved in this unusually deep sleep, but his experience as psychiatrist to two large children's asylums has amply demonstrated, he asserts, that all that is necessary to cure it is to prevent this extremely deep sleep at night. In mild cases, a nap during the day may be enough. Or the child may be put to bed a few hours earlier than usual but without darkening the room till the usual time. In the severer cases, the child is kept in bed all day long, in an atmosphere of calm and quiet. The repose is often distinctly beneficial in other respects. Excluding actual imbeciles and idiots, a cure may be counted on in 99 per cent. of the cases. Relapses are treated in the same way, merely by measures to make the night sleep normal; the factors responsible for the unusual depth of the slumber should be sought out and avoided in future.

THE REGULATORY FUNCTION OF THE KIDNEY IN NEPHRITIS

E. M. Watson, M.D.

Department of Physiology, the University, Sheffield

AMONG the duties performed by the normal kidney are the excretion of water, whereby the osmotic pressure of the blood is maintained, and the regulation of the reaction of the blood. Although the kidney in nephritis has been made the subject of much research, little prominence has been given to disturbances of this regulatory function.

It is true that the ability of the kidney to excrete water, under various conditions, has been studied by many but alterations in the reaction of the urine in pathological states of the kidney, has been shown comparatively meagre consideration.

Henderson and Palmer (1) observed that the reaction of the urine from nephritic patients was more acid than that from other subjects. Leathes (2) investigated the reaction of the urine in the nephritis of soldiers. He devised a method by which the diuretic power of the kidney may be ascertained and the reaction of the urine determined. Opportunity has been recently afforded of applying this test to a series of nephritis cases in the wards of the Royal Infirmary, Sheffield.

The test, which is a form of water test, is carried out in the morning. The patient is kept in bed and is allowed no food or drink after the evening meal the night before, until noon, with the exception of 500 c.c. of water which he is given to drink at 8 o'clock in the morning. The urine is collected in six fractions. All the urine passed between 10 P.M. and 7 A.M. is collected into one bottle. At 7 A.M. the bladder is emptied and this urine is received into the same bottle. The bladder is emptied again at 8 o'clock into a second bottle and immediately afterwards, the patient is given 500 c.c. of water to drink. He is asked to pass all the urine he can at hourly intervals until noon, that is at 9, 10, 11, and 12 o'clock, each specimen being received into a separate labelled bottle.

For the collection of the urine, it is advisable to use six large-mouthed bottles of about one liter capacity. To each are previously added 2 or 3 c.c. of toluol as a preservative. The danger of urinary decomposition is further prevented by having the patient pass his urine directly into the bottles; otherwise care must be taken that the vessel used for collecting it is dry and perfectly free from all traces of stale urine.

Each specimen is measured separately in a clean dry cylinder. Normally, the urine excreted during the night is scanty in amount, 30 to 40 c.c. per hour, and 500 c.c. of water produces a marked diuresis; the volume of the urine passed the first or second hour after the water being four to six times that passed the hour previously (Fig. 1). In nephritis, the volume of urine excreted per hour during the night is often increased above normal and the diuretic response diminished or absent (Figs. 2 and 3).

The method for determining the reaction depends upon the fact that the principal constituents in the urine which determines its reaction are the mono- and dibasic phosphates. The monobasic sodium phosphate or acid sodium phosphate (NaH_2PO_4) is acid in reaction, while the dibasic sodium phosphate (Na_2HPO_4) is alkaline in reaction (3). The urine reacts like a solution containing a mixture of these two types of phosphates. If in a solution, all the phosphate be acid phosphate, methyl orange will turn

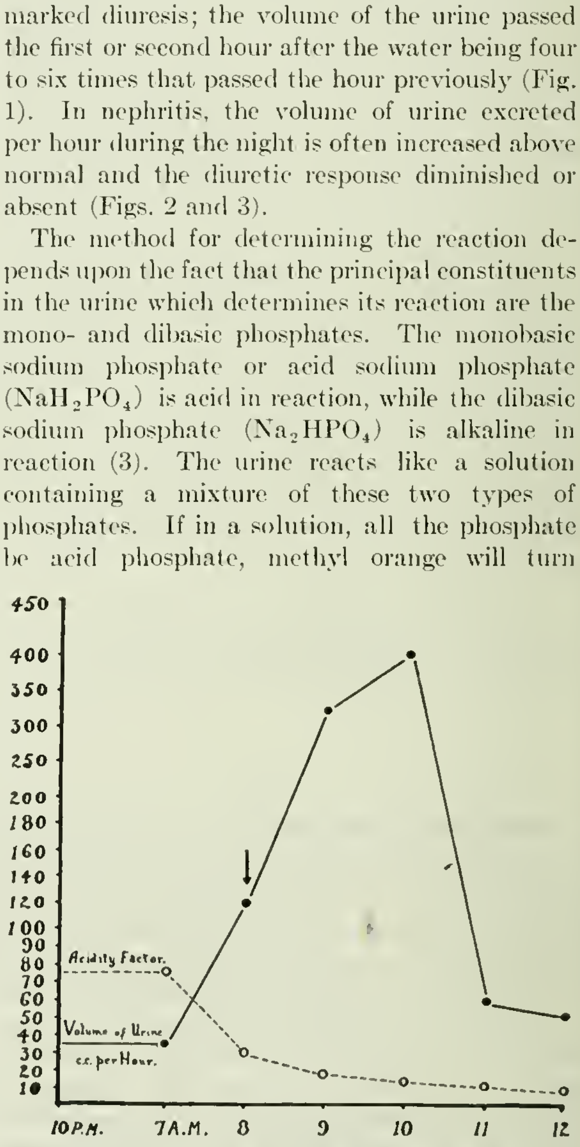

Fig. 1.—Normal curves showing diuretic response and alkaline tide in a normal subject. 500 c.c. of water given to drink at 8 o'clock.

pink. If there be any dibasic phosphate present, its color will be yellow. If,on the other hand, all the phosphate be basic, phenolphthalein will be pink; if there be also acid phosphate present, this indicator will be colorless.

The reaction of the urine usually lies between the turning points of these two indicators. So by titrating with decinormal acid and methyl orange and with decinormal alkali and phenolphthalein, the relative amounts of dibasic and acid phosphates can be determined, according to the results of the titrations. The ratio depends upon the reaction, therefore the reaction can be expressed in terms of the percentage of acid or basic phosphate. The percentage of acid phosphate may be referred to as the "acidity factor".

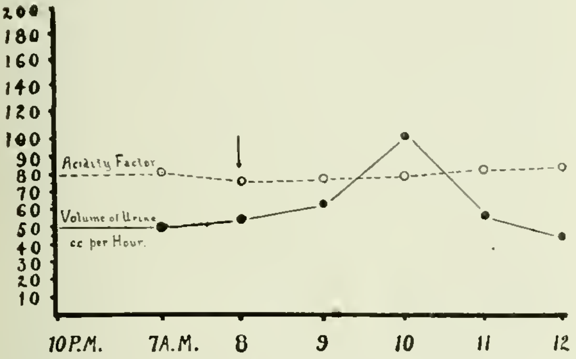

FIG. 2.—Nephritic curves showing high acidity factor, slight diuresis and no alkaline tide. 500 c.c. of water given at 8 o'clock.

Two 10 c.c. portions are pipetted from each specimen of urine into titrating flasks. To each flask are added 20 c.c. of distilled water, 4 or 5 drops of methyl orange indicator and 2 or 3 drops of phenolphthalein indicator. The contents of one flask of each pair is titrated with decinormal H_2SO_4 until the pink tint of methyl orange is obtained. The same flask is now titrated with decinormal NaOH until the pink color of phenolphthalein appears. This is repeated with the remaining five samples of urine. The second flask of each pair may be used as a control.

The amount of acid required represents the equivalent of the dibasic phosphates; the amount of alkali the total phosphates; while the difference gives the equivalent of the acid phosphates. The percentage of the acid phosphates can now be determined. This is the "acidity factor".

The normal subject, as well as the nephritic, produces during the night a urine which is acid. In the morning, the reaction, in the case of the normal person, swings strongly to the alkaline side (Fig. 1). This, as pointed out by Leathes, is the morning "alkaline tide". Most nephritic patients fail to show this normal alkaline tide but exhibit a continuously high acidity. The acidity factor was observed to be higher in the azotæmic type of nephritis (Fig. 2) than in the hydræmic type (Fig. 3) of Maclean (4).

That the cause of the normal variation in the reaction of the urine is not due primarily to the diuresis may be demonstrated in a person with normal kidney function by reducing the amount of water taken to 250 c.c. or even 100 c.c. There is, under these conditions, a corresponding diminution in the diuretic response but with a normal alkaline tide.

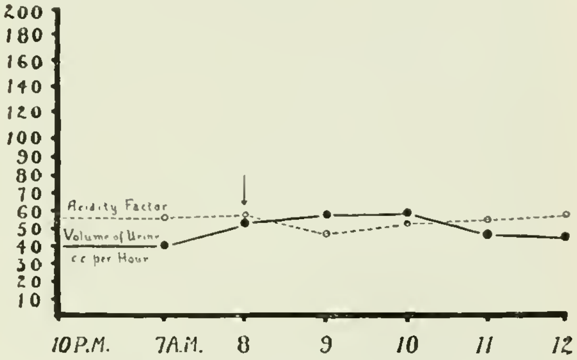

FIG. 3—Nephritic curves showing absence of diuresis and a very slight alkaline tide. 500 c.c. of water given at 8 o'clock.

Summary: (1) The regulatory function of the kidney is interfered with in nephritis as shown by the limited power of water excretion and the absence of the normal morning alkaline tide. (2) The nephritic kidney is apparently not unable to excrete an acid urine. The deficiency rests in the fact that it produces a urine with a high acidity factor at a time when a normal kidney produces a urine with a low acidity factor. (3) The water test, as described by Professor Leathes, may be used as a means for detecting impairment of renal function.

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TWO CASES OF A POLYNEURITIC AFFECTION RESEMBLING ACRODYNIA MET WITH IN YOUNG CHILDREN

LIONEL M. LINDSAY, M.D.

Physician to Children's Memorial Hospital, Montreal

ACRODYNIA is the name which has been given to an obscure affection met with in old or poorly nourished adults, most frequently in epidemics occurring at comparatively long intervals in various portions of middle and southern Europe. The symptoms are those of a polyneuritis, and resemble to some extent those of arsenical poisoning. Beginning with gastro-intestinal disturbance and impairment of general nutrition, burning pains in the palms of the hands and the soles of the feet with hyperæsthesia, become a marked and distressing symptom. These pains are associated with an erythematous rash most marked in the extremities; in some cases going on to an intense pigmentation; in others accompanied by the development of small vesicles or even bullæ. Photophobia and profuse lacrymation is a frequent accompaniment; the affection is afebrile excepting a short period at the very onset; it also appears to be self-limited, but severe cases may end fatally. Until recently the disease has not been regarded as an affection of early childhood.

The first epidemic in which this affection was studied and described occurred in Paris in 1828 and lasted till the winter of 1829-30. Since this epidemic cases resembling those met with in it have been reported in small groups at long intervals in Europe, Mexico and in both the East and West Indies.

In 1888, Henry Strachn, Senior Medical Officer of Kingston Hospital, Jamaica, reported 510 cases of what he termed "malarial multiple neuritis" in which the symptoms described resembled those met with in the Paris epidemic. In addition to the symptoms which have been enumerated, Strachn noted in many of his cases impaired vision and hearing, and a feeling of constriction along the lower part of the chest; also an eczematous condition on the tops of the eyelids, angles of the mouth and mucocutaneous margins of the nostrils. Pain was constant especially in the feet, emaciation developed with the course of the disease, but death was rare; the disease appeared to be self-limited, and recovery was the rule.

Since that date we hear very little of this affection until Dr. Weston, in a paper read before the American Medical Association in the Section of Diseases of Children (*Archives of Pediatrics* 1920, Vol. xxxvii, p. 573), reported eight cases in the practice of Dr. W. F. Patrick, of Portland, Oregon. The notes of these cases had been forwarded to Dr. J. Lovett Morse, of Boston, for diagnosis, but he declined to make one, and forwarded the reports to Dr. Weston, considering them suggestive of pellagra. Dr. Weston, while regarding them as like pellagra in some respects, thought they more closely resembled the obscure affection known as acrodynia, and as such reported them in his paper, at the same time giving us an account of what was known of that disease. In November of the same year, Dr. Albert Byfield, in a paper entitled "A poly-neuritic syndrome resembling pellagra (acrodynia?) seen in very young children", (*American Journal of Diseases of Children*, Vol. xx, p. 347), reports having met with seventeen cases in children all under 4 years of age, five of them less than a year old, with symptoms suggestive of pellagra, but differing from that disease in so many respects that it must be regarded as quite a separate affection.

Two cases similar in character to those described have been met with in the outdoor clinic of the Children's Memorial Hospital, Montreal, and in view of the infrequence of the affection would appear to be worthy of reporting.

D. H., female child, aged 2 years, was brought to the out-patient department of the Children's Memorial Hospital, January 30th, 1919, complaining of loss of appetite and weakness, and of pains in the hands and feet which were red, cold and swollen. She had been nursed by her mother for nine months, and had been healthy and well nourished until one month ago when her appetite fell off; constipation became troublesome and she began to lose flesh. The stools had been occasionally light in colour, but there was no indication of jaundice. Vomiting had not occurred. Perspiration was a marked feature. The hands and feet were of a bluish red hue and cold, and she complained that the toes were sore to touch. The child slept well. There was nothing in the family history of special moment. On examination the patient was described as a pale poorly nourished child weighing 20¼ lbs. miserable in appearance. Her temperature was 98 . Small nodes were palpable in neck, axilla, and groins. The hands and feet were red, swollen and remarkably cold. The body was perspiring freely and miliaria were seen over chest, abdomen and back. The mouth and throat were healthy. The teeth were good. There was no nasal discharge. The drum membranes on examination appeared to be normal. The heart and lungs were apparently quite healthy. The abdomen was flat and soft; the spleen was not felt; the liver was not enlarged. Urine was normal, but very concentrated. The specific gravity was 1,030; there was no albumen no sugar, no indican, and no acetone.

The child was brought again to the out-patient department at frequent intervals. The perspiration continued to be excessive, and the miliaria became more abundant; the hands remained always cold. On March 10th the temperature was noted as 101°F. and there were symptoms of bronchitis for which she was taken into the hospital. The child was described then as very pale and miserable; her weight was only 19¼ lbs, and there was marked photophobia. The blood count was as follows: Red blood corpuscles. 3,800,000; White cells. 9,700; Hæmoglobin, 74%. The Pirquet test was negative. The note on March 19th at the date of discharge from the hospital was as follows: Child a picture of misery; sits in bed with eyes almost closed; takes little food; loose cough with a few mucous, rales in chest; stool following cathartic brown in colour with considerable mucus. Temperature 99°F., weight, 19 lbs. 2 ounces. Symptoms otherwise little changed. On March 30th she was again seen in the out-patient department. She appeared to be a little better in every way. There was less photophobia, and the hands and feet were warmer, and of a better colour. The throat and lungs were clear and the appetite improved. A tonic containing tincture of nux vomica and bitter wine of iron were ordered. Improvement from this time set in. On April 28th she weighed 22½ lbs, and by the middle of June she appeared to be quite recovered, weighing 25¼ lbs., and the mother was directed to take her for some weeks to the Laurentian Mountains. The diagnosis in this case remained obscure. Tuberculosis, and chronic intestinal indigestion were considered and in turn were given up. It was more than one year before the articles by Weston and Byfield appeared. Aerodynia was not thought of and the importance of feeding was not recognized.

Second case. D. W., female child, aged nine months, was first seen April 29th, 1921. She was the first child born at term weighing 6¾ lbs. She was breast fed for seven months, during which time she throve well. After weaning she was fed on various mixtures of milk, water and sugar, or dextrimaltose, but failed to thrive. When first seen the infant was fretful, cared little for her food, but seldom vomited; the bowels were constipated, and the child was losing flesh. The hands and feet were always red and cold. It perspired a great deal, and had an erythematous rash over the body which appeared to be a source of irritation. The family history carefully inquired into presented nothing of importance on examination. The infant weighed 15¼ lbs. The temperature was 99°F., the general nutrition appeared to be fair: the colour on the body was good. There was marked photophobia, but no conjunctivitis. The musculature was soft. The hands and feet, but especially the latter, were purple, swollen and very cold. The body and head were perspiring freely, and miliaria had developed over back, abdomen and legs. The skin showed signs of scratching. The fontanelle was small; there was no craniotabes and no rosary or other signs of rickets. The infant had two teeth, the gums were healthy, the nose, throat and ears were all negative. The heart and lungs were normal. The abdomen was round and soft. No masses were to be felt, the spleen was not palpable. The liver was not enlarged. The infant was unable to sit alone, and made no attempt to stand. No spasticity or paresis could be made out. The urine was clear, pale, acid; no albumen; no pus; no sugar; acetone was present.

Acrodynia as described by Weston in his paper was diagnosed, and a simple diet prescribed including cereals, soup, orange juice and cod liver oil. Magnesia and liquid petrolatum were ordered for the constipation and a lotion for the miliaria. The child was seen frequently during the next few months until it was taken out of town for the summer. The symptoms showed little improvement. Small sores developed on the toes: these began as small vesicles which broke, leaving small ulcers. The sweat-rash continued to be abundant. The photophobia persisted. By the end of May the infant had cut two more teeth: the tonsils were injected: the feet were showing signs of desquamation in fine flakes: the infant's weight was 14¼ lbs. and the temperature remained steadily about 99°F. The blood count was. R.B.C., 3.900.000: W.B.C., 11.200; Hæmoglobin, 60%. Menthol and eucalyptol nasal drops were ordered. The infant was not seen again until October 19th. 1921. The infant was then 14 months old. It had been poorly all summer, but was thought to be somewhat better during the last few weeks. It still looked miserable; photophobia still existed; the appetite was poor, and the infant was constipated. She had cut three more teeth making seven in all, but she was pale and wan. Her weight was only 11½ lbs. The hands and feet were still purple and cold, but there were no sores on them. The gums were healthy and the teeth firm. The throat appeared normal. One drop of tincture of nux vomica three times a day was ordered to be given before food and bitter wine of iron in 10 drop doses three times a day after food.

It was the middle of December before she was seen again. The notes made then read as follows: There is marked improvement. This began about six weeks ago. She is now eating well: the bowels are fairly regular and the stools good. She is active and bright, but tires easily. There is no photophobia. The hands and feet are warm. She is now 16 months old, and has 16 teeth, and weighs 19 lbs. The child continued to improve steadily from that time and is now (June 1922) active, bright and well nourished.

RENAL TUBERCULOSIS

David W. MacKenzie, M.D.

Department of Urology, Royal Victoria Hospital, Montreal

TUBERCULOSIS of the kidney is a condition which is essentially chronic, markedly insidious in its onset, beginning usually in one kidney, progressive in character and making itself known generally by the bladder irritation which it causes. It is generally secondary to some other focus in the body. Kuster states that 10% of tuberculosis patients have kidney involvement. In 85,000 operations at the Mayo Clinic 0.6% were for renal tuberculosis. Kapsamer in 20,000 autopsies found 191 cases of renal tuberculosis, about 1%, and his bi-lateral cases showed old processes in one kidney and early in another. Notwithstanding the fact that much has been said and written in recent years concerning tuberculosis of the kidney, many of the patients suffering from this disease are not diagnosed until the disease is far advanced. Is it not true that the general profession still adopts the procrastinating attitude towards the early recognition of renal tuberculosis, which characterized our methods in regard to pulmonary tuberculosis twenty five years ago? Too often, I fear, we have been willing to veil our ignorance with the diagnosis of cystitis.

In the absence of definite urethral or vesical causes, every case of frequent and painful urination which persists and resists treatment of a simple nature should, until proved otherwise, be viewed as a potential tuberculosis of the kidney. Too often, however, patients with such symptoms are permitted to drift. Meanwhile, the condition in the kidney progresses until a simple cystitis is replaced by the deep seated lesions of the bladder, the bane of the operative treatment of renal tuberculosis. In a series of 112 cases of renal tuberculosis treated in our service at the Royal Victoria Hospital, the average duration of symptoms was 39.5 months; the longest was 30 years; the shortest was one month, and the findings seemed to show much older lesions. It is needless to say that for the best interests of the patients such cases should be diagnosed long before the lesions become so advanced. Early recognition of the disease not only improves the prognosis but, what is more important, it may prevent the unfortunate deep-seated lesions of the bladder so resistant to treatment.

Why should these patients be allowed to suffer so long? There are several reasons. First, a thorough knowledge of tuberculosis of the genito-urinary tract does not exist among our general practitioners; second, the treatment by surgical means is not generally known to be the best; and third, in the majority of patients the symptoms, though significant, are slight, and are not generally heeded. A small persistent irritation of the bladder which does not yield to ordinary therapeutic measures is just as suggestive of renal tuberculosis as a slight persistent cough is of pulmonary tuberculosis. Diagnosis in the proper hands can be positively made. The process in the early stages is generally unilateral, and treatment by nephrectomy is fraught with good results. Continued nocturnal bladder irritation accompanied by pyuria should be considered tuberculosis until proved otherwise.

There are certainly numberless cases of this disease which have been, and are, treated for cystitis. The diagnosis, although often beset with difficulties, is one which can be made with a nice degree of exactness. The poor results in treatment are caused by late diagnosis or by the late institution of the proper treatment. There is no doubt that the failures of relief of symptoms are in direct proportion to the delay in proper treatment. In 80 to 90 per cent. of the cases the initial symptoms are those of cystitis. The onset is usually gradual. The bladder irritation may be due to reflex irritability of the bladder in the early stages, and later to actual lesions of the mucous membrane all the way from a slight ulceration to the extensive erosion of the bladder surface. The patient may complain of frequency with very little pain and only slight burning on urination. Frequency may vary from every two hours to every fifteen minutes during the day, and twice to fourteen or more times at night. In many cases the desire to urinate must be satisfied at once; there is distinct urgency. These local symptoms may go on almost indefinitely, or there may be periods of remission, when there is comparative comfort. If the urine is examined at this time, it will be found that there is a polyuria; the urine is pale, of low specific gravity and generally acid in reaction, with some albumin and little or much pus. About 15% of patients complain of hæmaturia, and most of them show blood microscopically.

The symptoms referable to the kidney are notably few. In about 12 per cent. of the cases there is pain or discomfort over the affected kidney. These symptoms occasionally mark the onset of the trouble. The kidney may be large on palpation. This is brought about by an actual enlargement of the kidney itself or by a hydronephrosis caused by blocking of the ureter. The symptoms are sometimes ushered in by severe abdominal pain which is followed later by the bladder irritation. The general symptoms of tuberculosis, such as chills, fever, night sweats, and loss of weight, play a very small part in the diagnosis of the condition; in fact, they are conspicuous by their absence. In many patients, if the history is enlisted carefully, it will be found that preceding the appearance of any symptoms there is a period of gradual constitutional deterioration of an indefinite character. However, in the majority of cases these symptoms are not sufficient to attract attention.

When, therefore, a patient presents himself with a persistent irritability of the bladder, what is the procedure to determine whether or not these symptoms are caused by renal tuberculosis? And if they are so caused, how are we to determine which kidney is diseased? First, the careful history. A patient having any of the symptoms described above should be interrogated with tubercular kidney in mind. How long have the symptoms continued? Is there frequency of urination? Does the patient have to arise at night to urinate, and if so, how often? Next, a careful physical examination and particularly a careful examination of the urine. If pus is present in successive specimens, a search should be made for tubercle bacilli. Demonstration of this organism practically assures the diagnosis. If the organism is not found, it does not force the conclusion that tuberculosis is not present, because it is sometimes difficult to find tubercle bacilli in the urine particularly in the early or very late stages. However, with patience and some experience it will be found that the tubercle bacilli can be found in 75 to 85 per cent. of such cases. The other method, that of guinea pig inoculation, may demonstrate the presence of the organism, and is no doubt more eloquent than the staining method, but it has the additional disadvantage of taking up a great deal of time. A complete diagnosis is only made by catheterization of the ureters.

All such patients should have the advantage of a thorough cystoscopic examination where the slightest symptoms would lead one to suspect tuberculosis of the urinary tract. This is no formidable procedure. In the majority of cases it does not require a general anæsthetic, and it gives us more information than we can get in any other way. It is possible, by a consideration of the symptoms, examination of the ureter by vagina or rectum, and possibly by tuberculin, to locate the disease in one side or the other, but this gives no information as to the status of the other kidney, a very important factor in the prognosis and treatment. It is not always possible by the first cystoscopy to determine enough to warrant radical treatment. One thing that is characteristic of many of these patients is the extreme sensitiveness of the bladder and the consequent inability to hold much fluid. This naturally interferes with a successful examination. However, with a little patience on the part of the doctor, and rest and possibly slight local treatment for the patient, a successful cystoscopy with the aid of a local anæsthetic is possible in almost every case. In a bladder much involved it is often difficult even in competent hands to find and catheterize the ureter, as the mucous membrane is frequently so involved that the normal landmarks are entirely obliterated.

Frequently the intra-vesical picture is such that in the hands of an expert in cystoscopy, diagnosis and location of the disease are assured. The appearance of the ureteral orifices may be such as to indicate which kidney is involved. The opening of the ureter may be so surrounded with the granulation tissue that the passage of the catheter is not possible. Strictures of the affected ureter are often found of sufficient extent to prohibit the passage of the catheter, or even to prevent the infected material from the kidney from entering the bladder. This may allow the bladder partially to recover, although probably from time to time there may be enough discharge to give intermittent attacks of bladder irritability. Where the ureter is completely occluded on the diseased side, the term autonephrectomy, has been used to express in a way the effect upon the patient's general condition. If it is possible to catheterize and obtain specimens of urine from each kidney, the findings are of enough significance to warrant early radical treatment. The urine from the diseased kidney, on gross examination, is much greater in amount than that from the other kidney, often very pale, and lacking in yellow colouring of the normal side. Further examination shows it to be acid in reaction, of low specific gravity, with a trace of albumin, pus and tubercle bacilli. The urea percentage is lower as a rule than on the normal side. The phthalein output of the diseased is very much lower than that of the opposite side, which may be higher than a normal output, and it often shows a trace of albumin and casts, a true toxic nephritis which clears up promptly on removal of the diseased organ.

With a continued bladder irritability and acid pyuria with cystoscopic findings such as I have described, without demonstrating the presence of tubercle bacilli, the diagnosis is justified and radical procedure should be at once instituted.

Another important aid is the external physical examination. Nodules in the epididymis, vas or prostate are strongly suggestive; palpation of a thickened ureter per vagina or rectum is always a suspicious indication that the disease is on that side, if urinary tuberculosis has been previously proven.

Radiography may disclose the outline of the kidney, and may also show calcareous deposits. Pyelography may be used in those cases where the tubercle bacilli have not been demonstrated, and only where necessary. Keyes suggests some such trauma to bring down bacilli in urine when not previously found. Oxygen injection into perinephritic tissue has been advised.

Search for tuberculosis in other parts of the body should not be neglected. Tuberculin tests may aid, but they are not to be relied upon. The skin reactions are not of particular value because, even if positive, they do not aid in localizing the process. Subcutaneous reaction may help because besides being positive, it may occasion pain in the side of the affected kidney. I have not found it of any great assistance,

Renal tuberculosis must be differentiated from pyelonephrosis, renal calculus, renal tumours, non-tuberculous cystitis, vesical calculus, vesical tumours, etc.

The tubercle bacilli cause lesions in all parts of the kidney. The French school classifies miliary tuberculosis, nodular tuberculosis, ulcero-cavernous tuberculosis, tuberculous pyonephrosis, tuberculous hydronephrosis and tuberculous nephritis. It seems satisfactory to consider three main types, acute miliary, chronic or surgical and toxic tuberculous nephritis. It has been shown by Lawrason, Brown and others that tubercle bacilli may be excreted through healthy kidneys. Brown demonstrated that about 10 per cent. of patients suffering with pulmonary tuberculosis show tubercle bacilli in the urine without evidences of renal involvement. With lowered resistance and active processes, the kidneys may be showered with generalized tuberculous lesions which offer no hope for restoration of function or cure. Between these two extremes is chronic tuberculosis.

In this paper I have not considered the acute miliary type, since it is a part of generalized tuberculosis and offers no hope of surgical cure. Nor have I discussed toxic tuberculous nephritis, which may be either a part of general tuberculosis or secondary to a tuberculous mate. In the latter instance, the nephritis usually subsides after the removal of the tuberculous organ. A study of a series of kidneys removed at operation in our service for tuberculosis indicates in a general way the following paths of infection:

1.—Cortex: The bacilli entering the kidney by the blood stream gain a foothold in the loops of the glomerulus or in the capillary circulation supplying the tubules. Thus there are formed small primary tubercles which spread, fuse and generally caseate, extending to the medulla. Any injury of the endothelial cells, either traumatic or toxic, combined with the mechanical conditions of the circulation favours foothold foı virulent bacilli.

2.—Medulla: The earliest lesions seen in this zone appear frequently at or near the apices of the pyramids (excretory type). Tubercle bacilli which are discharged into the tubules are at this point exposed to stagnation, and possibly the action of crystalline substances, etc., in concentrated form may easily damage the epithelium. In this region we have frequently demonstrated stasis in normal kidneys. Blood and excretory infection may combine.

3.—Pelvis: Here the lesions apparently begin in the submucosa, the bacilli being brought by the blood or lymph route and gaining access due to local conditions of lowered resistance, as in the other types. Pelvic infections may, however, also become secondary to entrance of cheesy masses with bacilli from cortex to medulla. It must be remembered that these statements are very general and made only from observations on operable cases, that is on cases in which a diagnosis of unilateral involvement only was carried out and in which a good prognosis seemed justified.

The initial lesions are the typical tubercle formations. The subsequent history depends on the virulence of the bacilli and the local resistance. As a rule in the cortex multiple small foci form, which spread and coalesce.

In the medulla the pelvis usually becomes early involved and the kidney may be reinfected, giving the picture of an ascending infection. This is also the picture when the pelvis is the starting point.

Finally, all parts of the kidney, pelvis, medulla and cortex become involved, and it must be understood that a great percentage of the kidneys removed show this advanced stage in which it is no longer possible to venture even a guess at the location of the point of entrance of the bacilli.

There has been considerable discussion as to to the mode of infection of the tuberculous kidney but, at the present date, there is no exact unanimity of opinion. The original idea that tuberculosis of the kidney was caused by an ascending infection from the bladder up the ureter has long since been discarded. It is easy to see how this idea should have prevailed; the bladder symptoms are usually primary ones and therefore, it was incriminated as the original focus. Furthermore, Albarren in 1892, by injecting tubercle bacilli in the ureter, above a site of ligation, was able to produce renal tuberculosis. Wilbolt offered experiments to show that kidney tuberculosis could be produced by injection of tubercle bacilli in the unobstructed ureter but the kidney involvement which he obtained showed the lesion in the medullary substance of the kidney, which does not substantiate ureteral transmission. The work of Walker showed definitely that ascending infection up the unobstructed ureter did not occur. Halle and Moltz claimed never to have found a clinical or anatomical fact which would tend to establish the reality of an ascending tuberculous infection. Bauereisen states that with the flow of urine unobstructed, tubercle bacilli cannot reach the kidney intraureterally. Lymphatic infection has many advocates and probably is the route of infection in certain cases of tuberculosis. Bromgersma is a strong advocate of this path of transmission and has demonstrated at autopsy the extension of tuberculosis from the apex of the lung through glands along the aorta through the diaphragm to the kidney. Infection along the ureteral lymphatics, both in tuberculosis and non-tuberculous infection also has advocates. At the present time there is not sufficient proof to warrant a general acceptance of any one theory. Most authors concur in the belief that the usual path of infection to the kidney is through the blood stream, and there is abundant evidence to warrant the conclusion that this is the most frequent manner of renal infection. With a small tuberculous involvement within the body, there are frequently temporary bacillemias. It is therefore easy to appreciate how a kidney and constant filtering organisms could, under certain conditions, become infected. There are also instances of tuberculosis in the substance of the kidney without any evidence of tuberculosis in the urinary tract. As to the exact location of the initial lesion within the kidney, there is dispute. Cabot and Crabtree in their work on renal infections seem to believe that experimentally the earlier lesion is at the base of the pyramid. There is no accepted explanation for the fact that the lesion is at the base of the pyramid. It may be due to the conditions of the tubules in this location, since they are broader and the epithelial cells are supposed to possess phagocytosis, or it may be a vascular affair since at this region the arcuate divide into the interlobular and arteriolæ rectæ. It may be possible that the change to vascular pressure in this territory may have something to do with it.

Among the many interesting features of renal tuberculosis, none is more important than the apparent cures of the disease. The disputes among the relatively few practitioners who would treat renal tuberculosis without operation, and the many who urge prompt nephrectomy as soon as the diagnosis is made, can only be settled by a clearer understanding of what the apparent cure of renal tuberculosis means. The underlying difficulty in reconciling the opposing views is probably a lack of thorough understanding of the relation between the pathological lesion in the kidney caused by the tuberculosis, and the symptoms arising therefrom. Thus, it is not generally appreciated that the variations in the patient's general health, as well as his renal and vesical symptoms are due to alteration of the pelvic or vesical lesions, rather than to changes in the kidney parenchyma itself. Every case of early renal tuberculosis submitted to operation places in our hands a possible specimen suggestive of the fact that the renal lesions are far older than the duration of the symptoms would suggest. Indeed, the mere presence of surgical tuberculosis in the parenchyma of the kidney causes no symptom. Upon this fact it is scarcely necessary to insist. The familiar case-history, with its exclusive vesical symptoms is sufficient evidence that the lesion in the kidney parenchyma does not make itself felt until one of two things happens: either it extends through the capsule and excites perinephritis, or it extends to the pelvis and there sets up tuberculous pyelitis.

Tubercular pyelitis is common. Doubtless, the painful and frequent urination, which is often the most prominent early symptom of the disease, is at the onset caused entirely by tuberculosis of the pelvis and ureter. Judging from the specimens I have seen, this tuberculosis usually takes the form of disseminated sub-epithelial infiltration of the mucous membrane, with little tubercles, which give to the mucosa a kind of pebbled appearance. At this early stage the cavity of the kidney pelvis is usually very slightly dilated (apparently by the relaxation of its walls). There may be no ulceration except that upon the papillæ, the source of pelvic infection. Yet with lesions so slight as these, the patient may be urinating every hour with considerable straining urgency and terminal pain. If the kidney is removed at this time, the frequent urination is checked as if by magic, and does not return.

The next important pathological change consists in the extension of the tuberculosis to all the layers of pelvis and ureter, and to the bladder. Upon the mucous surface the tubercules ulcerate, and upon the outside they excite that adhesive inflammation about the pelvis and ureter with irregular thickening of the walls of those channels, which is so characteristic of renal tuberculosis. As a result of this ulceration and infiltration, the lumen of the excretory channel becomes more or less completely obstructed and the region above the obstruction dilates. Inasmuch as the cavity of the kidney pelvis itself often becomes almost completely obstructed by this process, the dilatation may affect only one portion of the kidney, though it usually affects the whole organ. Occasionally the obstruction is in the ureter, and the pelvis itself is widely dilated instead of being contracted. As a result of these pathological changes renal colic may occur from the passage of blood clots, or shreds of fibrin or tissue, or pain in the loin may result from distention of the kidney or a perinephritis; while a more or less definite sensitiveness and dragging pain in the side may result, either from the extension in the kidney and its pelvis or from the dragging of the shortened and thickened ureter, or from perinephritis. But if the ureter is not shortened, and if the retention either in one pole of the kidney or the whole kidney is sudden and complete instead of being gradual and incomplete, the patient's discomfort may suddenly cease either with or without renal colic. Even though the tuberculosis has extended down the ureter beyond the point of stoppage, if urine ceases to flow through the ureter the symptoms will promptly cease whether the flow of urine is checked by nephrectomy or by plugging of the duct-autonephrectomy.

In the light of these facts the varying histories of patients with renal tuberculosis are readily understood. The great majority of them have frequent and painful urination, and though from time to time very considerable remission of the symptoms may recur, they never entirely disappear; and as the inflammation progresses, invading more and more of the bladder, the general tendency is for the urinary distress to become more and more marked. Some patients fail rapidly in general health on account of partial retention, usually in the kidney pelvis, less often in the bladder. But the exceptional patient may continue to have fairly good drainage and exhibit a most extraordinary good health. On the other hand, once in a long while one encounters a case of renal tuberculosis whose symptoms have suddenly and completely ceased, and who has apparently regained perfect health without operation.

I have operated on several patients with intermittent or relative comfort from one to six months. The operative findings showed kidneys with walled off old tubercular cavities, cheesy, or calcifying and fresh lesions in the vicinity or opposite pole.

Caulk claims that there has never been in the history of medical literature a single authentic case of spontaneous healing of a tuberculous kidney. The ultimate outcome is always one of complete destruction of the kidney and usually severe mutilation of the rest of the urinary tract.

The treatment of renal tuberculosis when unilateral is nephrectomy, care being taken to remove all perinephritic infiltration of tuberculous tissue, and to avoid the discharge of any of the secretion from the severed ureter or pelvis. I am in the habit of suturing the wound without drainage.

Following recovery from the operation we must not forget to place the patient in the best hygienic surroundings possible. In fact a prolonged treatment as for pulmonary tuberculosis should surely be instituted and carried out.

THE REACTION OF THE BLOOD IN REFERENCE TO THE REGULATION OF RESPIRATION AND THE INFLUENCE OF ANAESTHESIA THEREON*

Ardrey W. Downs, M.A., M.D., D.Sc.

Professor of Physiology and Pharmacology, University of Alberta

In this paper it has been my endeavor to present for your consideration some of the latest work that has been done on the subject of chemical factors in the blood in relation to the activity of the respiratory centre. While recognising the existence and the importance of nervous impulses received by the centre, chiefly by the afferent vagus fibres distributed to the lungs, we shall disregard for the present this factor in the regulation of respiration.

It may be considered as definitely proved that in normal respiration lack of oxygen plays no part. The belief that carbon dioxide is the substance which normally excites respiration was confirmed and extended by Haldane and Priestly, who showed that respiration is so regulated as to keep the alveolar and blood tension of carbon dioxide practically constant for the same individual.

It is generally accepted at the present time that the H-ion concentration of the blood is alone concerned in the chemical regulation of respiration. A short time ago Scott (1) published the results of a number of experiments on the effect of the accumulation of carbon dioxide on the tidal air and on the H-ion concentration of the arterial blood. These experiments were performed in an attempt to produce a definite change in the H-ion concentration of the arterial blood due solely to carbon dioxide, and to study the coincident response of the respiratory centre and the total carbonate content of the arterial blood in an animal breathing gradually increasing percentages of carbon dioxide. With a gradually increasing percentage of carbon dioxide in the inspired air, a point is reached where, in spite of the accelerated respiration, sufficient carbonic acid accumulates in the blood to produce a detectable elevation in the H-ion concentration. Accompanying this increase in carbonic acid there is a very considerable elevation of the bicarbonate content above normal. During the preliminary period while the animal is respiring atmospheric air, the molecular ratio,

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$$\frac{H_2CO_3}{N_aHCO_3}$$

of the arterial blood is 1.4: 28.9, or $\frac{1}{20.6}$ At the end of the rebreathing period, when the carbon dioxide in the inspired air has risen to 6.45%, the ratio is 3.8: 49.6, or $\frac{1}{13}$.

In the experiments of Scott decerebrate cats were used as the experience of other workers in this field has been that they were unable to find any anæsthetic which did not depress the respiratory centre if given in sufficient dosage to prevent struggling. Urethanized cats show an apparently normal respiration when breathing atmospheric air, but when made to breathe increasing quantities of carbon dioxide the response of the respiratory centre is quite different from that of a decerebrate cat under the same conditions. The decerebrate preparation responds by a progressive increase in rate and depth. The animal under urethane shows increased depth only. For an atmosphere containing 5% carbon dioxide pulmonary ventilation increased twice as much in the former as in the latter.

From these observations it is evident that anæsthetics so depress the respiratory centre that it will tolerate a much higher percentage of carbon dioxide than will the normal centre. Hence the sensitivity of the respiratory centre is a very important factor in maintaining at its normal level the molecular ratio carbonic acid: sodium bicarbonate.

If we accept the hypothesis that the H-ion concentration of the blood is alone concerned in the chemical regulation of breathing it follows that the first appreciable increase in the tidal air in the above experiments must have been due to an elevation in the H-ion concentration of such magnitude that, although it was sufficient to stimulate the respiratory centre, it could not be detected in the blood itself by any means at our disposal.

Much has been written on the subject of acidosis but there is still some disagreement over the definition of the term. No doubt much of the confusion is due to a failure to distinguish between acidosis and detectable acidosis. As defined by some authors acidosis is a condition in which the bicarbonate in the blood is reduced below its normal level. Such a definition applies to the condition in which the acids responsible for the increased H-ion concentration are other than carbon dioxide, as in diabetes; but such a definition does not consider carbon dioxide acidosis in which, as shown, there is an increase in the bicarbonate content of the arterial blood above normal.

It is possible that further light has been thrown on the problem of the chemical regulation of respiration by the experiments of Hooker, Wilson and Connett (2). Hooker and his co-workers perfused the mammalian medulla, using perfusates of which the H-ion concentration and the carbon dioxide tension were known, and studied the effects produced by these two factors upon the activity of the respiratory centre. Their experiments were directed primarily to a comparison of the respiratory response elicited by blood, the H-ion concentration of which was altered to the same degree by the addition of carbon dioxide and hydrochloric acid. The medullary centres undoubtedly lose in functional capacity in the course of perfusion and one of the most important precautions to be observed is to guard against change in the irritability of the respiratory centre. If the perfusion of carbon dioxide blood produces the greater increase of respiratory activity when tested after as well as before hydrochloric acid we may believe that the carbon dioxide blood is the more effective stimulus. These experiments appear to prove that blood with a comparatively high tension of carbon dioxide causes a greater stimulation of the respiratory centre than does blood with a lower tension of carbon dioxide but with the same H-ion concentration. The method of stimulation is unknown. As the tendency for the diffusion of carbon dioxide from the cells into the blood depends on the difference in the tension of carbon dioxide in the two systems the higher the carbon dioxide tension of the circulating blood the slower the diffusion from the cells, and the higher the concentration in the cells when a new equilibrium is established. It would seem that the H-ion concentration of the cells and blood would likewise maintain an equilibrium. If this is true the H-ion concentration in the centre would be the same in both series of Hooker's experiments because the reaction of the two bloods was the same.

If we are to adopt an explanation for the results obtained, the most satisfactory point of view would seem to be that the H-ion concentration of the environment of the respiratory centre is its effective stimulus but that the irritability of the centre to this stimulus may vary. The normal irritability of the respiratory centre is, doubtless, the summation of a number of effects including those produced by carbonic acid, oxygen, and various ions, as well as changes in metabolic activity of whose nature we are still ignorant.

What I now wish to do is to make some application of the findings indicated to the problems connected with changes in the composition of the blood that confront us during anæsthesia. It is generally agreed that the capacity of the plasma for combining with carbon dioxide is decreased after either ether or chloroform anæsthesia. One influence of the anæsthetic is to decrease the alkali reserve. The decrease in carbon dioxide combining capacity is from 6 to 10 volumes per cent. This is an actual decrease and not an apparent decrease due to hyperpnœa, (Carter, 3). According to Reimann and Bloom (4) blood acetone bodies account for 20% to 100% of the bicarbonate fall observed, on the average for 60%. The balance may be accounted for by acetone bodies excreted, other (unidentified) organic acids resulting from incomplete oxidation, or a shift of bicarbonate from plasma to tissue cells. In this connection also it has been shown by Baldwin (5) that the acidity of the urine is increased during anæsthesia.

In an attempt to further elucidate the problem presented by these latter considerations a series of experiments was carried out in this laboratory (Department of Physiology and Biochemistry, University of Alberta) by Collip (6). The observations were made on patients who were operated on in the late morning. The bladder was emptied at 8 a.m. on the morning of operation. Just previous to anæsthetisation the urine was collected. Immediately after operation the bladder was catheterised and the urine again collected. The first urine voided by the patient was also preserved. Knowing the time and total volume of each sample, the rate of secretion was calculated. The relative acidity and the concentration of phosphates were determined by double titration according to the method of Leathes (7). This method depends upon the following considerations: In a solution of sodium phosphate, if all the phosphate is acid phosphate methyl orange turns pink; if any of it is dibasic this indicator is yellow; when it is all dibasic, and not before, phenolphthalein turns pink. In a solution of mixed phosphates by titrating with methyl orange and N/10 acid, the amount of dibasic phosphate is determined, and by titrating with phenolphthalein and N/10 soda the amount of acid phosphate present is determined. The ratio of the amounts used gives the ratio in which the two phosphates are present. This ratio varies with the reaction, and the reaction of the mixture may be given as so much per cent. acid or alkali. The reaction of the urine practically always lies between the turning points of methyl orange and phenolphthalein. Since the principal constituents of the urine that determine its reaction are the phosphates, the reaction of the urine may be expressed in the same way. Ammonia was also estimated and the rate of secretion of urine.

The acidity of the urine was increased in fourteen out of fifteen cases; the rate of secretion of ammonia was slightly increased in nine cases; phosphate elimination was decreased in ten cases.

The average results before, during, and after operation are as follows:

	Before	During	After
Secretion of urine cc. per hour	43.6	32.6	27.0
Acidity of urine	47.0	67.0	72.1
Phosphate excretion	24.5	22.4	26.6
Phosphate concentration	63.7	67.6	104.2
Ammonia excretion mgm. per hour	24.5	22.1	21.4
Ammonia concentration mgm. per 100cc.	65.4	72.8	85.3

Phosphate concentration is expressed in cc. of N/10 acid required for 100 cc. of urine in going from the phenolphthalein to the methyl orange point.

It is suggested by Collip that the increased ventilation of the lungs and the production of acid bodies during anæsthesia neutralise each other. He believes that the results of the experiments here outlined do not indicate any great alteration in the reaction of the blood. In anæsthesia there is not usually a detectable increase in H-ion concentration, that is, acidosis in the sense of being detectable is not present. The respiratory centre is depressed by the anæsthetic and will tolerate a higher percentage of carbon dioxide than will the normal centre but its response is such under ordinary conditions of anæsthesia as to keep the reaction of the blood nearly constant.

The point that is brought out by the foregoing discussion is, that the use of carbon dioxide by inhalation during anæsthesia is illogical. Carbon dioxide is probably the most effective stimulus to the respiratory centre and during anæsthesia, as a result of the action of the anæsthetic, the sensitivity of the centre is decreased so that it will tolerate a higher tension of carbon dioxide, and thus it might appear sound to administer carbon dioxide for the purpose of stimulating the centre, but from the experiments last quoted we learn that the response of the regulating mechanism is sufficient to maintain the reaction of the blood within physiological limits. Therefore, the administration of carbon dioxide does not appear necessary and it would seem unwise to run the risk of overbalancing this mechanism with the possibility of causing a fatal acidosis. (See Haggard and Henderson (8) for the report of an experiment in which a dog given hydrochloric acid intravenously in quantity supposed to be insufficient to cause death, dies following the administration of carbon dioxide).

On the other hand the administration of sodium bicarbonate to maintain the power of the organism to combine with acids produced during anæsthesia appears a rational procedure. Its use, however, is to be restricted to those cases in which there is positive indication for its employment. Here I am in accord with Reimann and Bloom (4) when they state that the preliminary administration of bicarbonate is to be resorted to only when the carbon dioxide capacity of the plasma is less than 58 cc. per 100 cc.

The conclusion I would draw is that in the normal individual under ordinary conditions the organism is capable of caring for the excess of acid bodies produced during anæsthesia and that intervention is not called for.

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Treatment of Heart Failure.—In the treatment of failure of compensation, Starling says, rest is most important. It not only diminishes the demands on the heart from the arterial side, but by removing the main cause for the return of the blood to the heart it enormously decreases the inflow into this organ; and it is inflow which in the healthy heart determines output. The value of oxygen, when there is any cyanosis, is explained by its action in diminishing the blood pressure necessary to drive a sufficient amount of blood through the brain, the relaxation of arterioles and the improved supply to the vital organs of the body, and the direct effect of a proper supply of oxygen in improving the contraction and aiding the reintegration and recovery from fatigue of the heart muscle. The plethora attending failure of compensation is a reaction on the part of the organism, as a whole, not on the part of the heart, and does not assist this latter organ. It may, in fact, be harmful when the heart is beginning to recover under the influence of the other modes of treatment just mentioned. One can, therefore, understand the beneficial effects of bleeding as a preliminary measure in certain cases of failure of compensation, as well as the value of diminished salt intake. Another factor of importance in enabling the heart muscle to recover its physiologic condition is the circulation through the coronary vessels. Starling is inclined to ascribe the beneficial effects of graduated exercises in heart disease very largely to the improvement of the coronary circulation brought about by the temporary rise of arterial pressure accompanying the exercises. So important is the coronary circulation for the functional capacity of the heart that every medical man should be aware of the manner in which this circulation is regulated. The oxygen usage of the heart is directly proportioned to the work it does, and its oxygen supply must therefore vary within the same limits as its work, *i. e.*, in a healthy heart from 1 to 7 or 10.—*London Lancet*, December 10th, 1921.

END RESULTS OF SURGICAL TREATMENT OF DISEASES OF THE STOMACH AND DUODENUM*

A. J. A. Hamilton, M.D.

Boston, Mass.

THIS paper is based on a series of 107 cases of diseases of the stomach and duodenum occurring in private practice, in which I have operatively demonstrated the pathology. Although the series is a small one, yet it seems to me that certain ideas of value may be drawn from it. The cases may be labelled as follows:

Ulcer of the stomach	16
Cancer of the stomach	26
Syphilis of the stomach	1
Pyloro-spasm	4
Gastric ptosis	1
Gunshot wound	1
Duodenal ulcer	55
Duodenal kink	1
Perforated duodenal ulcer	1
Undoing of gastro-enterostomy	1

The etiology of these lesions will not be discussed because that question does not come within the scope of this paper.

Gastric ulcer: Of the stomach cases, 14% were represented by benign ulcer. The age of the patients varied from 24 to 73 years, and the duration of symptoms before the case came to operation from 3 months to 30 years. In 11 cases a gastrectomy was performed with 1 fatality, a mortality of 6%. The amount of stomach removed varied with the size of the ulcer: in some cases half of the stomach was removed; in others four-fifths. After 2 to 8 years, 7 of these, or 63%, were cured, 2 were improved, and 1 case was unimproved. In 5 cases a gastro-enterostomy was done with no mortality. Of these cases, 3, or 60%, reported themselves cured 6 to 11 years after operation. The other 2 could not be traced.

The treatment of gastric ulcer depends upon the location of the ulcer and the amount of stomach wall involved. If the ulcer is located at the pylorus, a simple pylorectomy is indicated with an end-to-side anastomosis to the jejunum after the method of Balfour. If the ulcer is located in the pyloric portion on the lesser curvature, a more extensive partial gastrectomy should be done. If the open end of the stomach is over 4 cm. in length, a portion of it should be closed in the usual way before making the end-to-side gastro-jejunostomy. In cases of high lying ulcer, it has been my practice to do a more extensive partial gastrectomy with the closure of the proximal end of the stomach, and posterior gastro-enterostomy is then added. Every gastric ulcer should be regarded as malignant until it has been proved otherwise by the pathologist. Therefore, extensive removal of the glands, particularly those along the lesser curvature, should be a routine procedure. The 5 patients upon whom only a gastro-enterostomy was done were poor operative risks, but their condition was so much improved by the simple operation that, without exception, they declined to submit to a later gastrectomy.

A study of the readings of the patient's blood pressure, taken frequently during operative procedure on the stomach, has brought out the point that the greatest and most rapid fall in the pressure, and consequently the greatest shock, occurs when the lesser curvature is being handled and when the gastro-hepatic omentum is put under tension. For this reason, in doing a gastrectomy, it has been my custom first to free the greater curvature, next to cut across the duodenum distal to the pylorus, closing the distal end, and then do the necessary work on the gastro-hepatic omentum. This order in making the various steps in the operation places the time of possibly greatest shock at such a stage of the operation that the latter can be finished speedily, if necessary.

Gastric cancer: In this group there are 26 cases, or 24.3% of the total number, the age varying from 38 to 73 years. In 9 cases, gastrectomy was done with 4 deaths within one week; in 4 cases, gastro-enterostomy, with no immediate deaths; in 3 cases, in which the cancer was situated at the cardia involving the lower end of the esophagus, gastrostomy was done. The operative mortality in this group was 15.3%.

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*Read before the General Section, Canadian Medical Association, Halifax, N.S., July 7th, 1921.

Out of this group of 26 cases, 2 are now living; one patient has lived 2½ years and feels she is cured; the other was operated upon about one year ago for ulcer, but it proved to be lymphosarcoma.

Length of life following operation: 1, 6 years; 1, 4 years; 1, 3 years; 2, 2½ years; 1, 2 years; 18, less than 1 year.

As far as treatment is concerned, these cases may be divided into three groups: First, if the cancer is confined to the pylorus or the pyloric portion, gastrectomy should be done, with as wide a removal of the glands as is possible; second, if the growth is an obstructive one, even if wide-spread metastases be present, gastro-enterostomy should be done; third, in cases with extensive metastases, without obstruction, no operative procedure on the stomach is indicated.

The cautery should be applied to all cut surfaces in the operation for gastric cancer, and it is wise to keep the anastomotic opening as far away from the growth as possible.

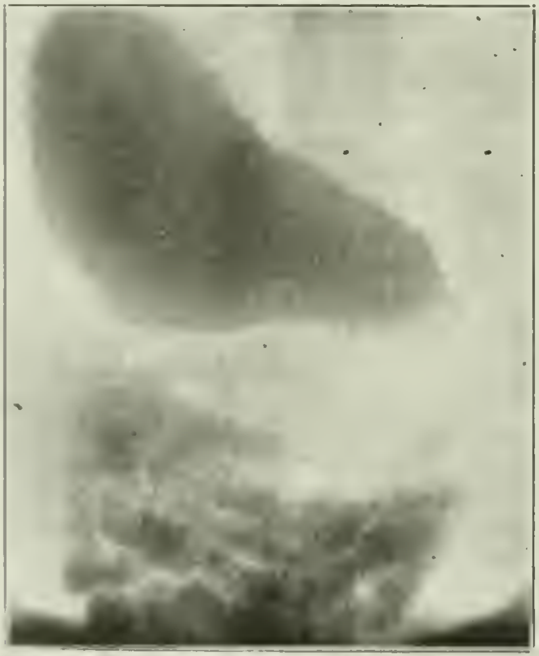

FIG. 1.—Pylorus crushed and ligated with fascia removed from the rectus sheath. This picture taken three months after operation.

Duodenal ulcer: There are many things to be considered in making the diagnosis of duodenal ulcer. The typical history is not always seen, and the X-ray has become a very important factor in diagnostic work in this field. Skill is required not only in taking the plates, but also in their interpretation. With the average roentgenologist, the plates and their interpretation are not to be regarded as of absolutely positive or negative value, but only as corroborative or non-corroborative, taken in correlation with other signs subjective and objective. History, laboratory findings, and the result of X-ray examination should all be carefully considered in coming to a conclusion. Even then, at times when everything seems to point to the presence of an ulcer, operation may fail to disclose such a lesion, and the pathology may be found in the appendix or the biliary tract. While the gall-bladder and the appendix are the two organs, disease of which produces symptoms simulating ulcer, the possibility of a lesion of the large bowel must never be overlooked.

In this group of 55 cases, or 51.4% of the total number, the age of the patients varied from 17 to 67 years, and the duration of symptoms from 5 months to 30 years. Fifteen of these patients were treated by gastro-enterostomy without any direct treatment of the ulcer. Of these, 11 (all showing stenosis) or 73% reported cured (6 to 12 years after operation); 2 were improved, and 2 could not be traced. The 2 cases in which only improvement followed operation were ulcers on the anterior wall, and in the ones untraced the ulcer was similarly located. Fifteen cases were treated by posterior gastro-enterostomy with infolding of the ulcer. One was improved, and

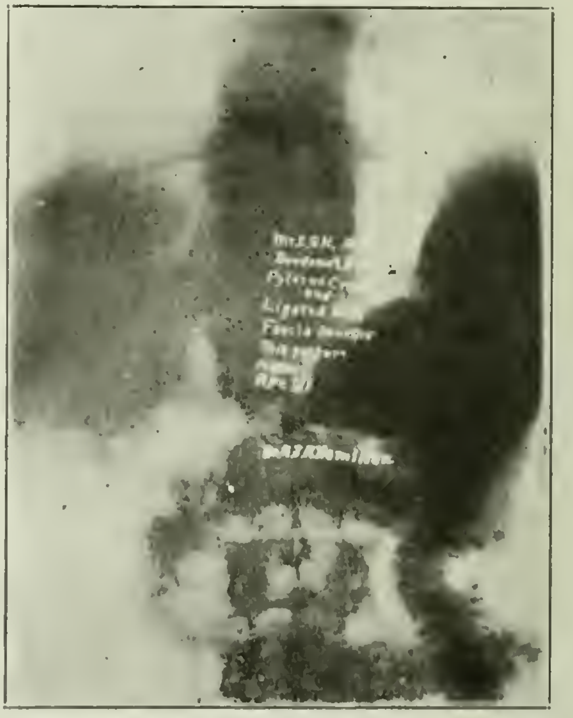

FIG. 2.—Pylorus crushed and ligated with fascia November 15, 1915. This picture taken April, 1921.

the remaining 14, or 93%, were cured (1 to 9 years after operation). In 7 cases, the ulcer was destroyed by cautery, and all were cured (1 to 2½ years after operation). The pylorus was crushed and ligated in 15 cases with the same result (1 to 7 years after operation). In 3 instances, pylorectomy was done because the hard, nodular ulcer, suggesting malignancy, extended beyond the pyloric sphincter, and all report themselves well (2 to 6 years after operation). Thus, in the whole group, 50 cases, or 90% were cured, 3 were improved, and 2 untraced.

All surgeons are not in complete agreement as to the operative procedure to be applied in the presence of these ulcers which vary so much in size, location, and degree of inflammation. Much doubt has been cast on the efficacy of the surgical measure which has ligation (blocking) of the pylorus as the essential. In my hands, crushing of the pylorus and its ligation with a strip of fascia has been very successful, both with regard to the production of a permanent and complete obstruction and with regard to the securing of lasting relief of the symptoms. (See Fig. 1, 2, 3, 4 in proof of the permanency of the obstruction thus produced). In my opinion, the Finney operation has its most successful field in the treatment of pylorospasm, and is not widely applicable in the surgery of duodenal ulcer. The best results will be obtained by combining gastroenterostomy with destruction of the ulcer (by excision or with the cautery) with infolding, or with ligation of the pylorus. Ulcers of the anterior wall are best treated by excision or by destruction with the cautery. Ulcers of the posterior wall, ulcers involving a great part of the circumference of the gut, and those in the neighborhood of which a diverticulum is found offer a more troublesome problem. Speaking from my own rather limited experience, I believe that there is considerable danger in attacking certain extensive ulcers (such as those I have just mentioned) with the cautery. It is quite impossible for a surgeon to gauge the amount of destruction done by a cautery; should the cautery come in close proximity to the wall of a sizable vessel and necrosis follow, a serious post-operative hemorrhage may be the result. I have seen two profuse hemorrhages occur 48 hours after the application of such treatment. In the presence of such an extensive pathologic process, it is my custom to crush the pylorus and then ligate it with a strip of fascia (about 4 inches long and ¼ inch wide) taken from the anterior sheath of the rectus. The knot tied with this fascial strip has a tendency to slip, and I always transfix the fascial knot with a Pagenstecker suture and tie the latter firmly. (See Fig. 5).

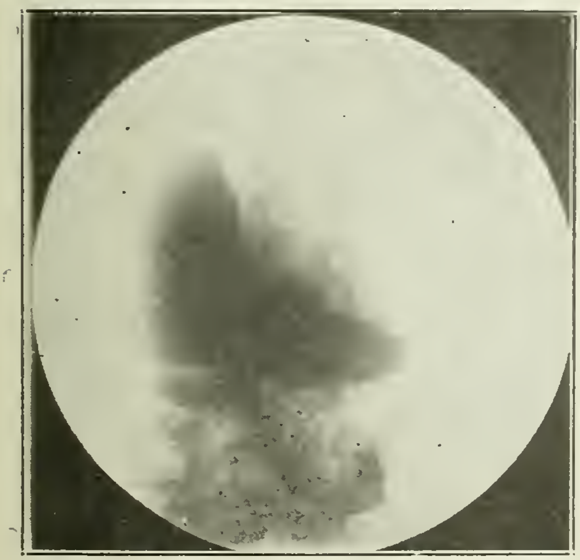

Fig. 3.—Pylorus crushed and ligated with fascia removed from the rectus sheath. This picture taken four months after operation.

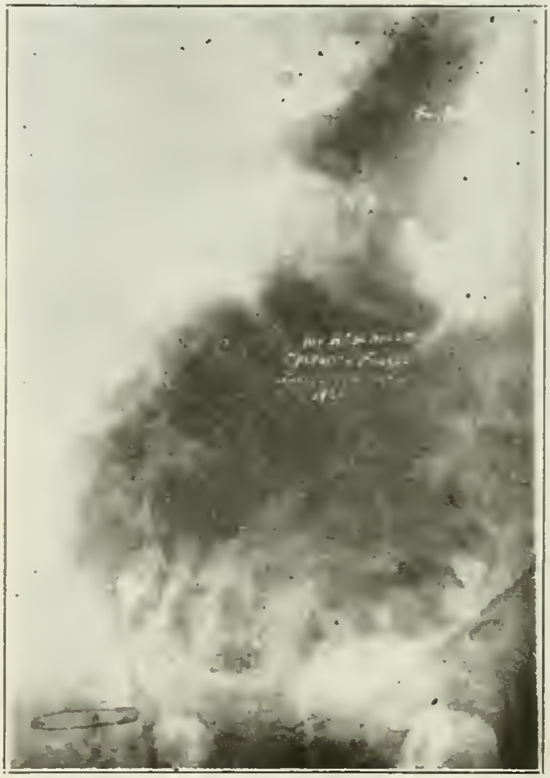

Fig. 4.—Pylorus crushed and ligated with fascia Feb. 1, 1916. This picture taken in July, 1921.

Miscellaneous group: In 4 cases of pylorospasm, pyloroplasty was done by the Finney method: 75% were cured, and 1 case remains unimproved. One has died since from a cerebral hemorrhage. In one case of gastric ptosis, suspension was done in 1912, and the patient has been well ever since. In a case of syphilis, gastro-enterostomy had been performed by a well-known surgeon without relief of the patient's symptoms. At the second operation, a gummatous condition was detected on the lesser curvature which readily cleared up under proper medical treatment. In one case of duodenal kink at the junction of the descending and transverse portions, gastro-enterostomy was done; the patient reports himself as cured. One gastro-enterostomy was undone. One gunshot wound of the stomach died 24 hours after operation. One perforated duodenal ulcer died 5 days after operation.

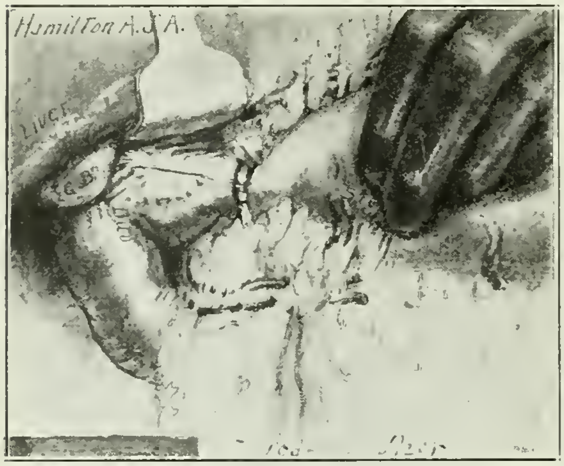

Fig. 5.—Pylorus crushed and ligated with fascia removed from the rectus sheath.

Conclusions: In summing up, it is my opinion that all chronic gastric and duodenal lesions (syphilis excepted) which show by the X-ray a deformity should be treated surgically. When an ulcer once becomes calloused, medical treatment can result in only a temporary cure of the symptoms, and the patient is still liable to the dangers of hemorrhage, perforation, and subsequent malignancy (in the gastric ulcers). Another point that must have consideration is the long time required for proper medical treatment in comparison with prompt relief usually afforded by surgery. The majority of the patients treated by surgery are back at work within two months.

Gastric ulcer: The treatment of a gastric ulcer depends upon the size of the ulcer and its location. If it is located at the pylorus or on the lesser curvature near the pylorus, a pylorectomy or partial gastrectomy is indicated, with a side-to-end gastro-jejunostomy. If the ulcer is located high on the lesser curvature, a more extensive gastrectomy, with a posterior or anterior gastro-enterostomy, should be performed. The sleeve operation should not be done, because subsequently the patient often develops constriction at the point of anastomosis. Every ulcer should be regarded malignant until proved otherwise by the pathologist, and an extensive removal of the glands is advisable. Barring accidents and with proper technic, there is no reason for a surgeon to expect shock or hemorrhage after the average gastrectomy. All vessels should be doubly clamped before dividing. Gentleness of operative technique usually means a comfortable convalescence for the patient.

Gastric cancer: Cases of cancer may be divided into three groups: (1) those without extensive glandular metastases, (2) those with extensive glandular metastases and obstruction, and (3) those with extensive metastases but without obstruction. Group 1 comprises those cases which we should attempt to cure by gastrectomy; in group 2, a gastro-enterostomy is the only procedure indicated; in group 3, operation would be useless and is contra-indicated.

Duodenal ulcer: The treatment of these cases depends upon the location and the size of the ulcer and the degree of mobility of the duodenum. If the ulcer is on the anterior wall of the duodenum and not too large, it should be destroyed with the cautery. In all cases of ulcer of the posterior wall, of annular ulcers, and of diverticula, I crush the pylorus and ligate it with fascia. The ligation method is applicable to all types of duodenal ulcer, while the destruction by cautery or by infolding is limited to those of the anterior wall.

CHRONIC ARTHRITIS—SOME PHASES IN ITS ETIOLOGY AND TREATMENT*

A. Almon Fletcher, M.B.

From the Department of Medicine, University of Toronto and the Toronto General Hospital

At the present time the cause of chronic arthritis is not known, and as a result its treatment is empirical. Chronic arthritis has always been a disease somewhat ill defined and misunderstood. In ancient medicine, sickness was thought to be due to some distemper or rheum, as it was called, and arthritis being especially under the influence of these evil humours was called rheumatism. Since then, up to the present day, its etiology has been loaned to any hypothesis which might be acceptable to medical fashion. Even its individuality as a disease entity has been common ground for dispute. Indeed, modern medicine has established the etiology of many cases formerly included in this category, and these cases may be given a more rational classification.

Such cases can be separated into three groups: first, those cases in which the arthritis is a manifestation of some other disease, as for example, gout, locomotor ataxia, hæmophilia, scurvy, possibly acute rheumatic fever; second, those cases in which the disease is secondary to some known infection, caused by various organisms, such as the tubercle bacillus, the pneumococcus, streptococcus, staphilococcus, gonococcus, the so called infectious arthritides; and third, those cases secondary to some disease of uncertain origin, such as scarlet fever, influenza, measles. Into the various groups, however, only a minor fraction of the cases can be so placed, and the remainder may still be described as chronic arthritides of unknown etiology. As to the nomenclature of this latter group, one might say that medical literature is a maze of terminology which adds little more than confusion. With our present knowledge of pathology and pathogenesis of this arthritis there is fortunately a tendency to adopt a classification as simple and non committal as possible. Arthritis Deformans is the name now generally applied to the disorder, and usually a division is made into the two sub groups, rheumatoid arthritis and osteo-arthritis. Rheumatoid arthritis is typically a poly-arthritis with pathological change in the synovial membrane and periarticular tissues. Osteo-arthritis is characterized more by hypertrophic bone changes. Both processes, however, may be seen in the same individual and it is doubtful whether arthritis deformans, in the clinic, can be divided by any hard and fast lines. McCrae (1) classifies the disease according to the predominance of the pathological change, adding a third group where bone atrophy is marked. His subdivisions, then, would be:—Arthritis Deformans—(a) with periarticular changes predominating, (b) with atrophic bone changes predominating, (c) with hypertrophic bone changes predominating. There is still left, however, a group in which no pathological change is demonstrable. Such cases have been called toxic, toxemic, infectious arthritis, chronic rheumatism, and so on. Usually they are milder and run a shorter course than true arthritis deformans. But sometimes they go on and show permanent pathological change. In what follows, I have used for convenience the term arthritis deformans to cover all types of arthritis of unknown etiology.

While the cause of arthritis deformans has not yet been established, there is a growing conviction that the disease is a bacterial process. This hypothesis was first defined by Schuller (2) in Germany, 1893, and by Bannatyne and Wohlman (3) in England in 1895. Since then, announcement has been made by many investigators that organisms had been isolated by them from the inflamed joints—Poynton and Paine and Rosenow make the most positive claims—but opposed to their results are the almost constantly negative findings of investigators in every country. The clinical picture, however, strongly suggests an infection and experimentally joint disease is readily produced by the intravenous injection of bacteria. In dogs, the disease may be simulated by the experimental inoculation of streptococci. This has been done by many workers and

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Nathan (4) states that by injecting streptococci intravenously into puppies, he obtained a joint inflammation, which went on to chronic deforming arthritis, and from the joint fluid or tissues no organisms could be obtained on culture.

This view that arthritis deformans is a chronic infection has completely changed the manner of its treatment. The clinical investigation is centred upon a search for some focus of infection, which if found is treated in radical fashion. Vaccines have also been used extensively. Removal of infectious foci sometimes brings about complete recovery and in other cases, it is followed by very considerable improvement. These effects are definite enough to demonstrate that infective foci may be intimately associated with joint disease. On the other hand, no focus may be found or, if found, its removal exerts little or no influence on the course of the illness.

It is common experience, on the other hand, that many factors favourably influence the different rheumatoid affections in individual cases; such as for example, change of climate, rest in bed, improvement in health, change of diet. And it is well known that these same factors in other patients have, apparently, no effect whatever. While reference to the influence of diet is repeatedly met with in medical literature, doubt is often expressed as to its real value, and there has been a general lack of agreement as to what changes of diet should be instituted. The failure to separate the gouty arthritides from true arthritis deformans has added further complication, and to this may be attributed the popular custom of restricting meats in all rheumatoid conditions. One form of dietetic regulation has been advised several times in recent years, namely, dietetic reduction. Fifteen years ago, Chittenden drew attention to the disappearance of chronic inflammation of a joint when he was experimenting with low diets. Guelpa, in France, the founder of treatment by starvation and purgation, includes rheumatoid arthritis among the diseases for which it is especially applicable. Pemberton for many years has been recommending reduction of diet in suitable cases, laying especial emphasis on the restriction of carbohydrates.

Over two years ago, an investigation was begun in the medical wards of the Toronto General Hospital to determine the importance of dietetic treatment in this disease and if possible to lay down some general principles as to what measures should be carried out. At first the carbohydrates were restricted in certain cases, in which all other forms of treatment had failed, with the result that quite marked improvement occurred in some cases and none in others. Later, it was found that better results were obtained by a more general reduction of diet, allowing plenty of "vitamin-containing food", and adequate protein. The uncertainty of the treatment, however, made it desirable to find some clinical indication for this line of treatment.

About this time, Pemberton and Foster, (5) in a series of metabolic studies in chronic arthritis, reported a lowering of sugar tolerance following the standard glucose meal. This test consists of the determination of the blood sugar curve following the administration of 100 gms. of glucose. These observers concluded that the lowering of sugar tolerance was the result of the disease and varied with its severity. In repeating this work, we also frequently found this lowering in sugar tolerance, but our results were not in accord with their conclusions. We found in many mild cases a well marked lowering of the tolerance, and in some severe ones, only a slight lowering thereof. We, therefore, carried out this test in all cases of chronic arthritis subsequently treated by dietetic means, to determine whether or not a study of the sugar metabolism might not reveal the probability of improvement by this treatment. We have now made a systematic survey of some 150 unselected cases of arthritis deformans, in which, under careful control, the effect of dietetic treatment has been observed and in which the sugar tolerance has been estimated.

A more or less general routine was carried out for all these patients. After rest in bed for at least two weeks, and after the disease had reached a stationary stage, the patient was given daily six glasses of milk and three of butter-milk, one or two oranges, half a grape-fruit for one week. This amount was then gradually increased by the addition of vegetables and fruits containing less than 15% carbohydrates, eggs, fish, fowl, meat, soups, junkets and jellies, and finally brown bread in small amounts, giving a daily intake of 1,500 to 2,000 cal. in four weeks' time. Those under weight were allowed in addition cod liver oil and cream. This four weeks represented the period of observation on which the results recorded here were based, but many patients have carried on since then with a diet chosen largely from the foods mentioned. During this period of four weeks, no other form of treatment was given except that the bowels were moved by enemata when necessary on alternate days, and that in a few cases liquid paraffin was given by mouth.

The results leave no doubt that careful dietetic regulation must be given an important place in the therapy of this disease. Four months ago, a special analysis of the first 100 cases was made for publication with the detailed reports of the sugar tolerance results (6). Of the 100 cases, 8 recovered, 43 were much improved, 28 were improved and 21 showed no improvement. (Table I). Those cases reported as improved showed relief in some form from the symptoms of the disease, especially pain, and also as a rule improvement in general health. In those reported as much improved, there was definite evidence for this on examination, such as decreased swelling, increased range of movement and relief of muscle spasm. Usually such improvement set in by the 4th to 7th day and continued for some weeks: sometimes the improvement was immediate and quite striking; occasionally it was delayed and appeared towards the end of the four weeks' period. Even more marked than these results was the improvement in general health. These patients were often anæmic, easily tired, sleepless, neurotic; they complained especially of disturbances relating to the digestive system, constipation, abdominal pain, eructation of gas, lost or excessive appetite. These symptoms generally became much less marked and sometimes even disappeared. On the other hand, it was unusual for a patient to experience much discomfort from the rigidity of this dietetic regime. Three patients were relieved of chronic eczema. A fall in temperature of one or two degrees was sometimes seen 48 hours after beginning treatment. Those underweight tolerated the low intake very well, and any loss in weight was afterwards made up without much difficulty. In those overweight, a loss appeared to be a distinct advantage and the patient was urged to continue his restricted diet. For most patients, however, it is desirable to ultimately increase the diet, giving the energy containing food more freely in the form of fat than in the form of carbohydrate. A high fat diet has recently been advised by Hubbard (7) for the treatment of chonic arthritis. When a patient had shown no benefit from his four weeks' course, he was not advised to continue; it may be added that no ill results were seen in those who were not improved. Table I also gives a separate tabulation of the results in men and of the results in women. From this, it is evident that women, as a group, are much more favourably influenced by dietetic treatment than are men.

TABLE I

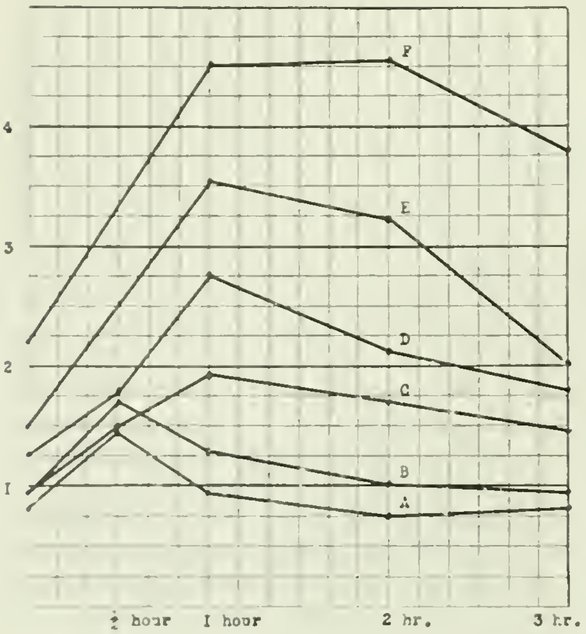
Summary of the Results of Dietetic Treatment

	Total	Male	Female
Recovered	8	0	8
Much improved	43	14	29
Improved	28	10	18
Not improved	21	13	8
Total	100	37	63

The sugar tolerance test was carried out according to Hamman and Hirschman. After a fast of fifteen hours, 100 gms. of glucose was given in 300 c.c. of water, with the juice of half a lemon; 250 cc. of water, one and two hours afterwards. Blood sugar estimations were done at varying intervals, afterwards, usually 1 hour, 2 hours and 3 hours, but sufficient information may be obtained from the 1½ and 3 hour determinations. Folin and Wu blood sugar methods were used. The generally accepted normal for the blood sugar curve, after administration of 100 gms. of glucose, is one which from the fasting level of .6 to 1.2 mgs. per c.c. does not rise above 1.7, and returns to the original level in less than 1½ hours. A curve, then, which rises above 1.7, or which does not return to the fasting level in 1½ hours, denotes what has been called a low sugar tolerance. Various degrees of lowering in this tolerance were seen in the cases studied. For purposes of comparison, an average has been made of the blood sugar readings following the glucose meal; that is to say, an average of the 1, 2 and 3 hour determinations, or of the determinations made at 1½ and 3 hour intervals, and an arbitrary grouping of the cases has been made according to these averages:—group 1, cases in which the average was less than 1.4; group 2, cases in which the average is from 1.4-2, and group 3, cases in which the average is greater than 2.

Examples of different curves are shown in Figure 1. Curves A and B are typical of a normal tolerance (Group 1). Curve C shows a tolerance moderately lowered (Group 2). D and E are curves showing a more marked lowering of tolerance (Group 3). F is the curve of a case of moderately severe diabetes, which was admitted to the hospital as one of chronic arthritis. It should be pointed out that the fasting blood sugar does not always vary with the height of the curve. In other words, a patient, who has a markedly lowered tolerance, may have a normal blood sugar.

FIGURE I



The results of treatment in the different cases, grouped according to the sugar tolerance, is given in Table II. Those which were simply improved, *i. e.*, those who showed subjective improvement only, are placed with those who showed no improvement, since subjective improvement is a very uncertain quantity. Cases showing objective improvement and those which recovered are also given together. Of 24 cases with good sugar tolerance, Group 1, 3 (12.5%) showed objective improvement. Of 56 cases in Group 2, 31 (55.3%) showed similar improvement, while in Group 3, *i. e.*, cases with well marked lowering in the tolerance, of 20 cases, 17 (85%) showed objective improvement. These figures demonstrate that there is a fairly close relationship between the response to dietetic reduction and the sugar tolerance. 56% of the cases, however, are in Group 2, where a definitely favourable result was obtained in slightly over half its number. In these patients, some further idea of the probable benefit of treatment may be obtained by an examination of the patient's diet. Those whose diet formerly consisted largely of carbohydrates offer a better prospect of improvement when put on the dietetic regime outlined above.

Since the analysis of these 100 cases was made, many more have been so treated with similar results. I have also had an opportunity of following a few cases among returned men. These were all obstinate cases of some years' duration. Those with a low sugar tolerance as a rule received very considerable benefit; those with a good tolerance showed little or no improvement.

TABLE II

The Effect of Treatment on Cases Grouped According to the Sugar Tolerance

Average Blood Sugar reading for 3 hours....	Less than 1.4	1.4 to 2	More than 2
Recovery or showing objective improvement ...	3 (12.5%)	31 (55.3%)	17 (85%)
No objective improvement	21 (87.5%)	25 (44.7%)	3 (15%)
Total	24	56	20

In Table II, a separate record is made of the results in men and in women.

TABLE III

	Less than 1.4		1.4 to 2		More than 2	
	Men	Women	Men	Women	Men	Women
Recovery or showing objective improvement.	0	3	12	19	2	15
No objective improvement	15	6	8	17	0	3

The clinical significance of this investigation might be discussed briefly. It shows the clinical importance of dietetic control in this disease, and it has been also demonstrated, since such treatment may be inconvenient or tedious, that the sugar tolerance test is a useful clinical indication of the value of such treatment in individual cases. Besides this, the correlation of the effect of diet, and the degree of the lowering of sugar tolerance, seems to show that in many cases sugar metabolism is associated with the cause of the arthritis. This view received some support from clinical experience for it was found that the administration of excessive carbohydrate would sometimes bring on an exacerbation of the disease. Such a view is not incompatible with the infectious theory of its etiology, and it was evident that, in those cases which received benefit by this treatment, there were the same clinical signs of infection as in the other cases. It is well known that infections may be influenced by diet; for instance, the clearing up of boils in a diabetic by restriction of the food intake. The frequency of infections in animals, deficiently fed, may have some bearing on this point, and the whole question of food balance must be given careful consideration in interpreting the above results. Deficiency disease usually occurs in animals when the diet is low in vitamine and protein, but other factors must be taken into account. The work of Colonel McCarrison is especially suggestive in this connection, for he has shown that deficiency disturbances occur much more rapidly in animals when carbohydrate is supplied in excess. Considerable clinical evidence has been published to show that vitamines have a therapeutic value in chronic arthritis. This has been our own experience; for example, many cases may be much improved by the administration of cod liver oil, and occasionally improvement is seen after the administration of yeast. Careful scrutiny of the diets of arthritic patients will often reveal lack of balance in their food, the most frequent being inadequate or unsuitable protein, insufficient vitamine and carbohydrate excess. Sometimes, the simple restoration of a proper food balance will result in relief of symptoms. The part played by fats is not quite clear. Experimentally, excess fat accelerates deficiency disease and, as has been said, restriction of fat certainly appears to be beneficial in those patients over weight. In patients under weight, the administration of fat, high in vitamine content, seemed to be beneficial.

The better results obtained in female patients is also significant. It is my opinion that the reason for this is that dietetic unbalance is much more common among women. Their manner of living and also some inherent differences of metabolism may be other factors to be considered.

It should be finally emphasized that this paper has attempted to deal with one phase only of the treatment of arthritis deformans. Foci of infection should always be looked for, and if possible, removed. There is no doubt that dietetic treatment is much less effective if such foci are left untreated. After the course of treatment described, it has often been found worth while to carry on with various forms of hydro and physio-therapy. Cinchophen is quite useful in a small group of cases, even when no evidence of gout can be found. Salicylates are less frequently of value. Other forms of treatment prove to be of value in various cases. The results, however, reported here were carried out under careful control, and must be attributed entirely to the dietetic treatment.

To sum up then:—It appears that arthritis deformans is an infectious or toxic process, which may frequently depend upon a disturbance of nutrition or of metabolism, and that benefit may be obtained by dietetic treatment, directed towards the control of such a disturbance.

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Decapsulation of the Kidneys.—Fawcett (*Guy's Hospital Gazette*, January 21st, 1922) discusses decapsulation of the kidneys in subacute or chronic parenchymatous nephritis, and quotes the case of a man, aged 39, suffering from subacute tubal nephritis, with some interstitial change and uræmia. Under treatment in hospital for three months the blood urea fell to normal—namely, 0.29 gram per litre—and his general condition improved, the hæmaturia disappeared, and the œdema, headache, and dyspnœa became less, though the quantity of albumin remained high at 8 to 10 parts per 1,000. During two months' absence from hospital the symptoms returned and decapsulation of both kidneys was performed. The patient rapidly recovered from the operation, and within three or four days the œdema and albumin became considerably lessened, though not entirely disappearing, and his general condition has remained satisfactory. The presence of cardio-vascular and interstitial changes in addition to the tubal nephritis accounted for there not being still greater improvement, since such good results cannot be expected in the former type of case as in the latter. Decapsulation is contraindicated in all cases of advanced granular kidney with high blood urea and deficient urea excretion.—*Brit. Med. Jour.*, June 3rd, 1922.

BONE SUPPURATION THE BASIC CAUSE OF RENAL CALCULUS IN TWENTY CASES FOLLOWING WAR-WOUNDS*

H. Ernest Paul, M.D.

Toronto

It is very doubtful if any definite conclusions could be drawn from a review of the very extensive literature dealing with the etiology of stone in the kidney, and such a review is obviously beyond the scope of this article. To illustrate the trend of medical opinion, however, the citation of a few representative opinions on this etiology is considered justifiable.

In 1821, Prout of London gave as the principal causes of lithic acid in the urine, simple errors of diet; unusual and unnatural exercises of the body and mind, particularly after eating; the want of proper exercise at all times, and debilitating circumstances. Seventy years later, Lagueu of Paris gave as the principal etiological factors, sedentary occupations and hereditary predisposition, at the same time concluding, from a review of a considerable number of cases, that renal calculus occurred more often in the male and was most prevalent in the fourth decade of life.

In 1909, Schade, after extensive experimental and clinical observation, concluded that irreversible colloids, the commonest example of which was fibrin, are necessary for the formation of calculi and was of the opinion that fibrinuria in slight degree occurred more often than was commonly thought.

In 1910, Sir Almroth Wright suggested that a search for a bacterial cause be made in every case of urinary calculus. He, later in the same year, reported four cases of his own.

In 1913, Ohlmacher of Detroit, writing from the point of view of one doing special practice devoted to therapeutic immunization, states that the concurrence of bacteriuria and urinary calculi has long been known, and draws the following conclusions:—

1.—"The routine bacteriologic analysis of all cases of renal calculus and the associated pyuria and bacteriuria, is indicated."

2.—"Therapeutic immunization with autogenous bacterial vaccines should be attemptep in non-operative cases of calculus, pyuria and bacteriuria for the relief of bladder irritability and impaired general health, and in cases in which there has been operation, when the symptoms persist unduly."

In 1918, Hugh Cabot in 'Modern Urology', discussing the etiology of renal calculus, concludes as follows:—"Supersaturated urine is secreted by the kidney under certain conditions which are at present unknown. In this supersaturated urine, crystallization occurs. These crystals, under certain conditions of retention, are held in the urinary tract for a time sufficiently long to enable them to grow to a size which constitutes a true concretion or calculus. Infection is a factor only insofar as it gives rise to conditions favouring retention and in that it affects the chemical composition of the stone."

In 1920, C. H. Mayo regards the infection theory of the origin of kidney stones as the only tenable one, and compares the development of stone in the kidney to the development of the shells of fresh and salt-water molluscs which are built up by the bacteria feeding on the pabulum of the exuded mucoid material of the molluscs. If these bacteria become misplaced within the body of the mollusc, a pearl or slug develops as a result of such misplacement. He concludes "Stone formation is evidently the result of the combination of two types of bacteria; the first creates an infarction with minute necrosis causing mucoid exudate; the second factor is the elimination, at the same time, of the stone-forming bacteria that they may come in contact with the mucoid material. If the stone originates in the cortex of the kidney, its growth will be slow, but if it originates in the calyces or pelvis, growth may be much more rapid because of the ease with which its chemical material is secured."

Bone suppuration, or osteomyelitis, is described by Stengel and Fox as an infective disease resulting from hematogenous infection in the course of various diseases, from local infections, in cases of traumatism (fracture, amputation) or from periostitis. Various micro-organisms, including staphylococci, streptococci, typhoid bacilli and the bacillus coli communis, have been recovered from the blood.

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*Read before Section of Surgery, Academy of Medicine, Toronto, February 21st, 1922.

References, or case-reports, pointing to any special relationship between osteomyelitis and renal calculi are very few in the literature of either disease. Le Fur, in the discussion of Mayet's article, reports a case as follows:—"We recall a case of a young fellow of 20, who, following injury to the marrow (moelle) by a bullet, had a vesical retention which was immediately treated by cystotomy; he presented, without infection, a bilateral renal lithiasis...... which I successfully operated upon."

Mayet's case reported in the above mentioned article, was a boy of seven years immobilized for Potts' disease, in whom an abscess, which developed in the left iliac fossa, was repeatedly aspirated and injected. Four years after the abscess disappeared, hematuria developed and radiology showed, beyond doubt, the presence of a calculus in each kidney. The author is inclined to attribute these calculi as being secondary to a renal tuberculosis, though admitting that the inaction and the excess of phosphates ingested had quite possibly facilitated the production of the renal calculi.

In the discussion of this case, Cathelin did not believe that the immobilization or the ingestion of lime phosphate had very much to do with it; he thinks there were bacilli in the urine.

Pasteau, in the same discussion, says "It seems that there are cases of injured who have wounds of the marrow......... Infection is the rule in these cases at the end of a certain length of time and death comes on by renal infection and the formation of secondary calculi."

Many cases, no doubt, are to be found in the literature in which renal calculi are described as associated with, or follow, bone suppuration or injury, but are not reported with special reference to the etiology. For instance, Hugh Cabot in 1910, among representative cases given to illustrate the operative technique, reports the following:—

"A man, aged 34, suffered a severe crushing accident involving the left hip from which he recovered with considerable stiffness and some shortening of the leg. About a year after the accident, he passed a stone from his bladder, which troubled him only in its passage through the urethra. Three years later, renal colic and hematuria drove him to the hospital. Stone in the left ureter was shown by X-ray, and removed by proper incision. Recovery was uneventful."

Rosenow and Meisser in a recent article report the production of calculi in five out of six healthy dogs by sealing a culture of streptococcus repeatedly isolated from the urine of a case of nephrolithiasis into the teeth of the dogs.

They state:—"The evidence of infection of the urinary tract, and the lesions in the kidney were slight except where obstruction in the ureter had occurred from impacted stone.

The same streptococcus was isolated from the kidneys, from some of the stones, and from the teeth of the dogs, and its elective affinity for the medulla of the kidney in rabbits, on intravenous injection, was demonstrated; it was found in the lesions of the collecting tubules where crystallization and stone-formation were beginning."

As all personal cases here reported occurred in ex-soldiers, it may be asked:—Are men on active service for several years, pre-disposed to the development of renal calculi? No statistics are available to enable one to give a definite answer to such a query.

The frequency of calculi in the urinary tract in the French army, has been pointed out by Rochet and Boulouneix, as well as by F. Cathelin, the first-named surgeons having seen as many as 42 cases, the latter, with his colleagues, having operated 6 cases of stone in the kidney, and seen a dozen others. All of these cases, however, occurred in men of middle age and no bone lesions are mentioned, and, aside from the fatiguing life in the field, no specific mention is made to an etiological factor.

Herewith are given short synopses of twenty cases of nephrolithiasis which have come under observation during the past three years at the hospitals of the Department of Soldiers' Civil Re-establishment situated in Toronto.

All tests of renal function by the administration of phenolsulphonephthalein and indigo-carmine were done intravenously. Four of the earlier cases were operated by Dr. N. S. Shenstone and the laboratory work was done under the supervision of Dr. G. W. Lougheed.

All the cases here reported, occurred in men. The oldest was 37 years, the youngest, 22 years, the average being 28.5 years. Eleven occurred in the third decade of life, nine in the fourth decade.

Five patients had been subjected to thigh amputations, and were consequently less active in their habits of life during the two or three years

RESUMÉ OF CASE HISTORIES

No.	1	2	3	4	5	6	7	8	9	10
Age	20	22	31	27	27	27	30	37	29	25
Examined	22-4-19	16-4-19	Oct 1919	1-10-19	6-2-20	6-4-20	9-6-20	10-10-20	12-12-20	15-12-20
Wound and date	shrapnel back 24-4-17	legs and back 17-8-17	chest Aug 1918	fracture CPD left femur Nov 1917	wound and amputation rt thigh	fracture wound femur, June 1916.	wound rt thigh, amputation 27-9-18	wound of chest, Aug 1917	wound right shoulder, leg and back 18-4-18	wound of rt. thigh, Apr. 1916
Complications	Pneumonia, [illegible]		boils				catheterization	Hæmothorax phlebitis rt femoral temporary paraplegia		osteomyelitis, 3 years. perinephritic abscess Feb '20.
Suppuration	[illegible]	14 months	[illegible] weeks	4 months	prolonged	5 weeks	6 months	prolonged	6 weeks	prolonged
First sign of stones	[illegible] years after wound colic	7 months after wound colic	1 year after wound colic	19 months after wound colic	1 year after wound hæmaturia	3½ years after colic	11 months after, colic	colic, 5 months after wound	colic, left, 1 year after wound	colic Rt. 4 years after wound Aug 1920
Course	repeated [illegible]	[illegible]	repeated attacks rt renal colic	repeated abdominal pain [illegible] in ureter seen by cystoscopy	repeated abdominal attacks	repeated colic and Hæmaturia right	repeated colic, 11 months left loin	repeated attacks first left then right Feb 18 operation, right not completed Sept 18 5 stones from right May 20, 1 stone from left Abscess in right loin scar septic Dec '20 1 stone from right	slight pain hæmaturia	repeated attacks.
Radiograms	[illegible]	[illegible] rt ureter	[illegible]	negative	1 Jan 1919 1 stone in rt ureter 2 Aug 1920 stone in left kidney pelvis	1 negative 2 stones rt ureter 14-1-21	stone in left kidney pelvis	stones shown in both kidneys on various occasions	stone in left kidney	stone in right
Urine	[illegible]	[illegible]	infected staph [illegible]	[illegible]		infected pus, blood	infected blood	pus and blood	pus blood	pus cocci
Phthalein	[illegible]	[illegible]	[illegible]	normal	[illegible]		48%	left [illegible] total [illegible]	50%	low
Treatment	[illegible]	[illegible]	[illegible]	[illegible] removed through cystoscope	1 passed per urethram 2 nephrotomy and removal of stone	dilatation of ureter stone passed	pyelotomy June 1920	two nephrotomies right one pyelotomy.	pyelotomy 27-1-21	removal of pyonephrotic kidney and stone 31-12-20
Results	recovery	recovery	recovery	[illegible]	recovery	recovery	recovery	recovered	recovered	recovery

RESUME OF CASE HISTORIES.—*Continued*

No.	11	12	13	14	15	16	17	18	19	20
Age	34	33	24	25	32	31	37	33	26	27
Exam'd	15-12-20	3-1-21	25-1-21	22-2-21	3-6-21	13-6-21	13-6-21	28-6-21	5-9-21	25-1-21
Wound and date	right knee 30-9-18	31-3-17 multiple wounds and amputations	wound rt, thigh, 13-8-17	wound of rt. lung. 16-7-18	wound of left arm. 26-9-18.	wound of back and knee joint. 22-12-17	fracture of femur 12-11-15, wiring.	wound of left arm loss of rt. eye. 20-3-16	wound rt thigh and buttocks. 12-8-18.	wound of left thigh 14-3-17.
Complications		hæmorrhage and repeated operations.	amputation	hæmoptysis.	influenza.	amputation. Jan. 18. amputation, 1919		Five operations on arm.	Trench fever 1917.	sequestra discharged. 2 later operations
Suppuration	2 years.	6-8 mos.	2-3 years	1 month.	2 months.	3 months.	7 weeks.	prolonged	6 weeks.	6 mos.
First signs of stone	colic two years after wound	hæmaturia, pain in right loin, after 9 mos.	colic, 3½ years after wound	colic on left. 2½ yrs. after wound.	pain in back. albumen. nephritis? 9 mos. later	1921 aching. May 1918, sand in urine.	pain in left loin. 4 mos. after operation.	April 18. pyelitis, rt. no stones found.	Aug. '19. pain in left groin.	Jan. 1918 rt. side pain. appendix removed.
Course	Nov. 1920 patella removed, joint cleaned out. Repeated attacks of colic.	repeated attacks, right renal colic.	repeated attacks	pain one year then colic. right and left.	20 mos. after the wound, rt. renal colic. hæmaturia. rt. ureter.	June 1921, bloody urine. severe pain in left loin.	persistent. pain considered nephritis.	repeated attacks of colic.	pain, fever. bladder irritation, treated for nephritis for 18 mos.	repeated attacks of pain on right side in groin from Jan. 18-Aug 19. nephrotomy stone removed. rt. recurrence Nov. 1921
Radiogram	shewed no stone.	1. small stone. 2. large stone later in same spot. Rt.	stone in rt. ureter	calculi in right and left.	stones in right kidney and ureter.	stone in left.	stone in left kidney. pelvis.	stone in rt. ureter 28-6-21.	stone in left ureter. 5-9-21.	1. stone in right. Aug. 1919 2. large stone in same kidney. Nov. 1921.
Urine	infected.	infected staphylococcus. blood.	infected	infected indigo carmine test good-left.	infected.	infected.	pus and blood	Sterile on Culture	infected. left-pus. B. coli.	pus and blood.
Phthalein		52%	normal.	34%	good. excretion.	good excretion.			good.	60%
Treatment	cystoscopy, stone removed. rt. ureter	18-1-21 pyelotomy. large stone removed.	dilation of ureter. stone passed into bladder, removed by cystoscope.	30-3-20 rt. pyonephrotic kidney removed, 9 stones. left renal colic again. pyelotomy	ureter dilated. stone passed.	lavage of both kidney pelves.	24-6-21 pyelotomy large stone. mulberry.	28-6-21 lavage of rt. kidney pelvis. dilation of ureter.	dilation of ureter. X-ray shewed stone 4 in. lower. 5-9-21. repeated.	second nephrotomy Jan. 1922 after lavage of kidney pelvis. Jan. 1922. soft stone filling middle calyx lavage after operation.
Results	well.	recovery	recovery	drained. recovery	free from symptoms.	improved. some pain 1922	recovery	1 stone passed. X-ray shewed first stone in old place seems well.	stones passed per urethram. x-ray neg. recovery.	meruchrome and silver nitrate. 3 dilations of ureter. infection less. patient still under observation.

immediately preceding. Of the twenty patients, nine might be said to have led a sedentary life of necessity, from the nature of their wounds, while in the remaining eleven no change in the activity of their habits could be said to have taken place.

Three cases were found to have bilateral calculi; of the unilateral calculi, eleven occurred on the right side and six on the left, which proportion of right to left corresponds roughly with the figures of recognized authorities.

Four had previously passed calculi or had had calculi removed.

The average time elapsing from the date of receiving wounds to the date of the first renal symptoms, was 17.7 months, the longest period being 44 months, the shortest, 4 months.

In every case, with the possible exception of case 19, there appeared to be a very definite history of bone-suppuration, with the systemic infection always present with osteomyelitis.

A history of a systemic infection having no relationship to wounds is found in three cases shortly before, or soon after, being wounded, *viz.*, in case 3, furuncles of the trunk and back; in case 15, influenza, and in case 19, trench fever. It would appear to be more than a coincidence that in these three cases the suppurative process in the wounds was of comparatively short duration.

Four of these patients had been subjected to appendectomy, and four had been treated for considerable periods for nephritis before nephrolithiasis was suspected.

The urine from the affected kidney in eighteen of these cases showed well-marked characteristics of infection, the commonest offending organisms being the staphylococcus aureus and the bacillus coli communis; in one case, the urine showed no signs of infection on repeated microscopic examination, but no culture was made, and, in one case, the urine from the affected side was sterile on culture. (case 18).

Staphylococci appeared to be by far the most common infecting organisms, very frequently associated with the bacillus coli, and in no case were streptococci found. In making the foregoing statement, it is admitted that in the great majority of these cases cultures of the urines were not made as a routine, and that microscopic reports on the urines were relied upon. The bacteriology of the urine was investigated in a few cases where post-operative treatment by autogenous vaccines seemed indicated, and in every case the predominating organism proved to be staphylococcus aureus.

The function of the affected kidney, judged by the excretion of phenolsulphonephthalein or indigo-carmine given intravenously, in sixteen cases, was very slightly impaired,—in one, moderately impaired, and in three cases, markedly impaired.

In twelve patients, the calculi were removed by operation; in six, the calculus causing the symptoms was passed or removed after intraureteral manipulations, while in two, no removal has been attempted but symptoms were apparently improved and temporary relief given by dilatations of the ureter and lavage of the kidney-pelvis. The diagnoses in these two cases have been repeatedly confirmed by radiology, persistent slight hematuria, etc.

Three of the cases operated had previously been operated for removal of calculi. In several of the latter cases operated, in whom the urine persisted in showing considerable pus from the affected kidney, gradual dilatation of the ureter, with lavage of the kidney-pelvis, has been carried out over a considerable length of time. In a few cases this post-operative treatment has been supplemented by the administration of autogenous vaccines, though no definite benefit from these vaccines alone has been noticeable. In only two cases was marked evidence of retention in the upper urinary tract from ureteral strictures or kinks, misplacement of the kidney, malformation of the kidney-pelvis, found either on cystoscopic investigation or at operation. Investigation of this phase of the subject could, however, have been more thorough.

CONCLUSIONS

1.—While definite conclusions, applicable to all cases of nephrolithiasis, cannot be drawn from twenty cases, there is undoubtedly a very definite etiological relationship between the bone-suppuration and the formation of renal calculi in the cases herein reported.

2.—Approximately ninety per cent. of these cases show definite signs of infection in the urine from the affected kidney, which fact, together with the literature quoted, is fairly good presumptive evidence that infection is a definite contributing cause, if not the most important cause, of renal calculi.

3.—Lack of drainage in the upper urinary tract is seemingly not an important primary cause of the formation of renal calculi following such a systemic infection as osteomyelitis.

4.—Sedentary habits of life likewise have no direct relationship to calculus-formation, where such formation follows a systemic infection as osteomyelitis.

5.—If every case of nephrolithiasis could be investigated with sufficient thoroughness, a history of a preceding systemic infection could be elicited. Until such time as experimental and clinical investigation gives us some other definite cause, might not the presence of nephrolithiasis be considered presumptive evidence of a previous systemic infection?

6.—The removal of calculus from the upper urinary tract should be considered only an important preliminary step in the cure, and treatment of the concurrent infection must be thoroughly carried out if recurrence is to be avoided

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STUDIES IN RADIUM*

Hugh Mackay, M.D.

Winnipeg, Man.

RADIUM is a name to conjure with. Its introduction as a therapeutic agent in the realm of medicine signalizes the inauguration of a new epoch in the forward march of the healing art. At the same time, a word of caution against over-enthusiasm regarding its curative effects and reliance on its properties, to the exclusion of other tried and proven, though less spectacular agencies, is in order.

The element, radium, was isolated from its compound twenty years ago by Madame Curie. It combines rapidly with constituents of the air to form salts of radium, in which form it is used in the arts and sciences. These salts have different physical properties as set forth in the following table:

Radium chloride soluble in water,
Radium bromide soluble in water,
Radium carbonate, insoluble in water, soluble in acids,
Radium sulphate, insoluble in both water and acids.

It will be seen at a glance that the sulphate is the most stable of the compounds. The prospective purchaser of the radium element would do well to stipulate that this salt is supplied in any apparatus he may purchase, and thus guard himself against possible financial loss through damage from an unstable product.

Radium is one of the group of bodies that are said to be radioactive. Briefly, these bodies possess the following distinctive properties:—

1st.—They affect a photographic plate in a manner similar to sunlight.

2nd.—They cause certain substances to become phosphorescent or fluorescent.

3rd.—They cause the air and other gases to become partial conductors of electricity.

4th.—They generate heat.

Madame Curie demonstrated that the heat given off from a gramme of radium would raise an equal weight of water from the freezing to the boiling point every 45 minutes. Heat means energy—capacity for work. The energy bound up in the radium atom is 250,000 times as great as that of any other atom known to us. It is estimated that the latent force stored up in one gramme of radium is sufficient to raise a Dreadnought of 28,000 tons 100 feet in the air.

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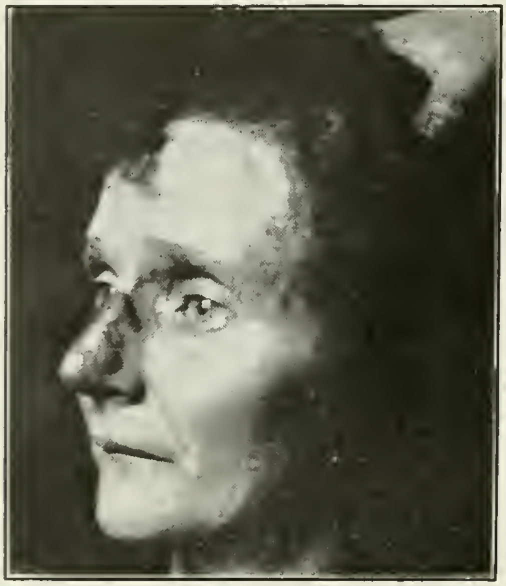
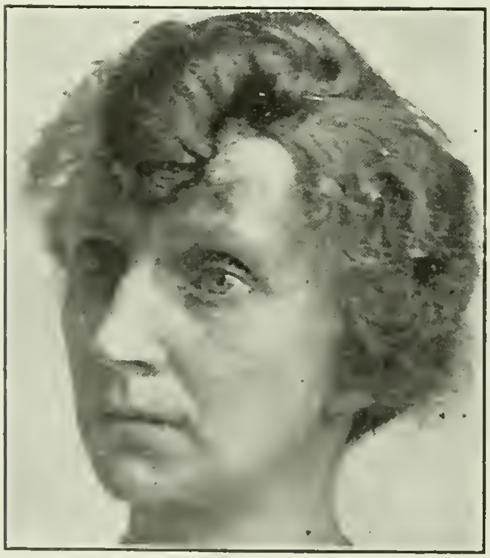
*Read before the Winnipeg Medical Society, March, 17th, 1922.

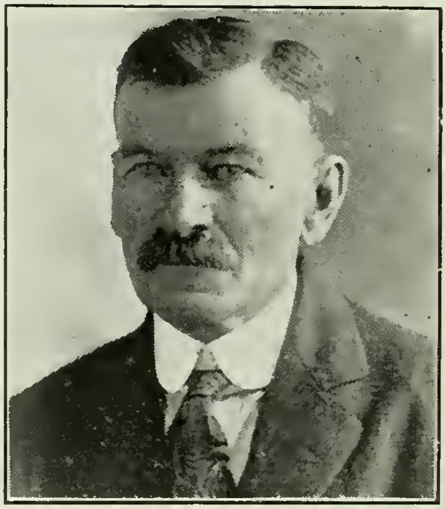


Case 1.—Lupus Erythematosus before treatment.

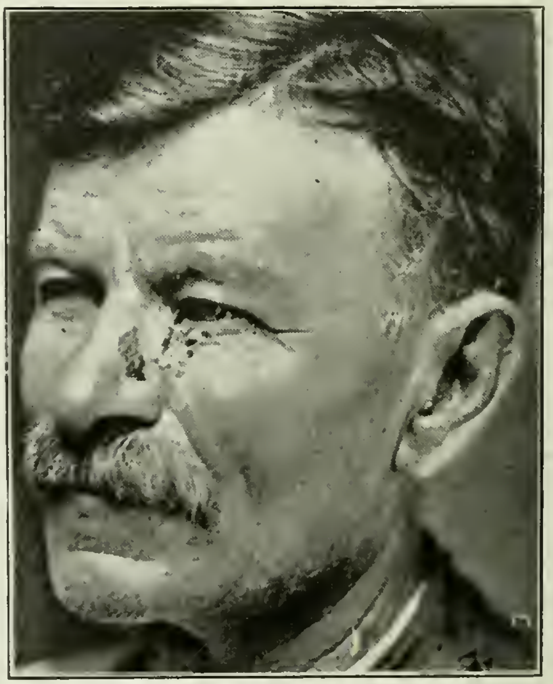


Case 1.—Lupus Erythematosus after radium treatments, September, 1921.

In 1803 Dalton formulated his atomic theory. The word atom derived from the Greek meant indivisible, and was applied to the smallest particle of matter known to exist in any chemical element. Of recent years, doubts have been thrown on the doctrine of the fixity and stability of the atom. In the case of the radioactive bodies, it was demonstrated that the atom was breaking up with tremendous velocity, and in the throes of this atomic destruction a new science—that of radioactivity—was born into the world, for the basic and fundamental change in these extraordinary substances, is the disintegration of the atom.

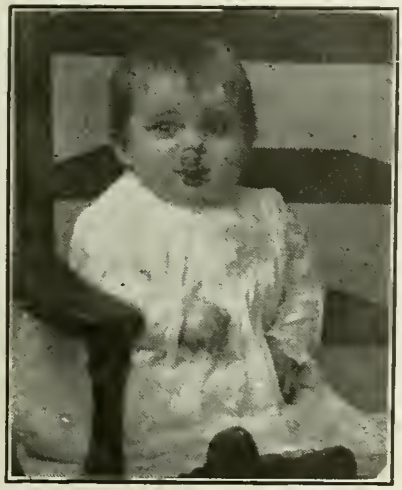


Case 2.—Rodent ulcer of the face. Photograph not retouched. Taken October 4th, 1921, four months after a single exposure of radium subcutaneously.



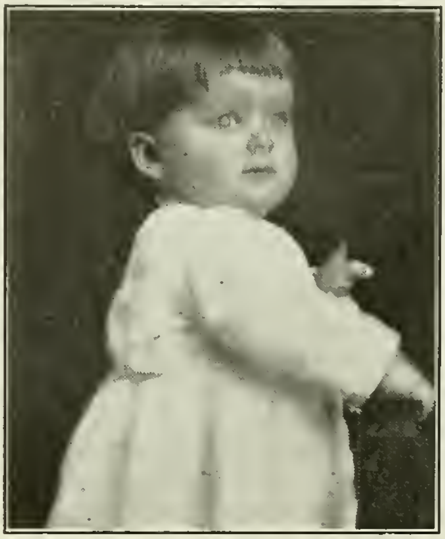
Case 2.—June 15th, 1921. Rodent ulcer fifteen years duration. Healed October 4th, 1921, single application buried radium.

The rays given off by radium are spoken of as alpha, beta and gamma. The alpha ray has very little penetrating power. A sheet of writing paper will cut it off. It is a negligible factor therapeutically unless the salt is given intravenously, being removed by the walls of the different containers in which radium is marketed. The alpha ray comprises 90% of the radiant energy. The beta ray is 100 times more penetrating than the alpha ray. It is of great service therapeutically in many superficial lesions of the skin or mucous membrane, being credited with penetrating from 1 to 3 centimeters into the tissues. It is unsuitable for long exposure or for deep work, and under these conditions should be filtered out, either partially or entirely. Brass, silver, lead, rubber or other substances are used for this purpose. The beta ray comprises 9% of the radiant energy. The gamma ray is 100 times more penetrating than the beta ray. Many of these rays will penetrate through the body; some of the harder rays will pass through a foot of lead. One per cent of the radiant energy is made up of the gamma ray. These rays are given off equally and in all directions. In topical applications more than half of the radiant energy is dissipated in the atmosphere, so that less than one-half of 1% of the total energy is utilized in deep work in topical applications. Even at this, the greatest possible caution must be exercised, or horrible and even fatal accidents may ensue. Irreparable damage may be done in the viscera by the gamma radiation without injuring the overlying skin in any way.



Case 3.—Capillary and cavernous naevus upper lip. Excised once. Electric needle four times. Failed to control.

Radium has an extraordinary property in its ability to give off a gas or emanation which can be readily collected. This emanation has the same therapeutic virtues as the parent salt. Radium will give off this gas continuously throughout a lifetime and remain practically unchanged at the expiration of that interval. If the emanation is to be used as the therapeutic agent, one of the soluble salts is employed. Under these conditions, a large quantity of radium is needed. An expensive plant to separate the gas must be installed, and a trained physicist engaged to supervise the work. In many clinics the emanation is used exclusively. It is put up in small capillary glass tubes, about ½″ in length, and about the size of a cambric needle. A quantity of the gas capable of doing the work of many thousands of dollars worth of the salt may be stored in each of these glass needles. The life of the emanation is only a few days, whereas radium itself is almost proof against the passage of time as we measure it, its half life being computed at 1,750 years.



Case 3.—Superficial and deep naevus of lip (Capillary and cavernous), showing result of one superficial and one deep application of radium.

Administration

Radium is usually applied topically. It may be buried in the tissues in the form of radium tubes or radium needles It is sometimes given by inhalation of the emanation, or watery solutions of the soluble salts may be administered by the mouth. It has also been exhibited intravenously and solutions of the bromide or chloride salts have been injected subcutaneously. The use of buried needles is rapidly gaining in favor. Approximately 2½% of the radiant energy is utilized by this method.

In general terms it may be said that pathological tissues are more radiosensitive than the normal. Because of this varying tolerance it is possible to change the type and character of the diseased cell or destroy it entirely, at the same time sparing the normal. The successful radium therapist must so gauge the exposure that these ends may be attained. Too light a dose means failure to obliterate the morbid process, too strong an exposure damage or destruction to normal tissues.

The therapeutic uses of radium are many and varied. In the treatment of naevi it has proved of great service. The superficial capillary naevus may be treated by a 5 or 10 milligram plaque protected by a rubber finger cot, kept moving over the involved area for varying periods of time. The deep or cavernous naevi are treated by screened radium held away from the skin for a distance of ½ to 1 inch, or by tubes or needles buried subcutaneously. In chronic lupus erythematosus it is of proven value. In basal cell epithelioma of the face it has a wide range of application and is constantly gaining in favor, the cosmetic effect is better than by any other remedy. In leucoplakia it ordinarily clears up the lesions promptly. In deep seated and more virulent malignancies it may be used as an adjunct to surgery. It has a distinct place as a palliative measure in inoperable malignancies, usually relieving pain, lessening discharges, making the patient more comfortable, and prolonging life.

In sarcoma, Hodgkin's disease and lymphosarcoma, it is the remedy of choice.

The following photographs illustrate the effects of radium treatment. Case 1—Mrs. P.—; lupus erythematosus of many years' duration, topical applications of radium. No recurrence after nine months.

Case 2—Mr. M.—Referred by Dr. Ross, Selkirk—rodent ulcer of 15 years' duration; clinical diagnosis confirmed by biopsy, made by Dr. Nicholson. A 12½ milligram needle was buried under each of the lesions and left in position for 5 hours. Four months later, the skin was entirely healed; free from recurrence after nine months.

Case 3—Baby F. Cavernous naevus of the lip; excised surgically once, needled four times, recurrence. The bulk of the tumor was on the inner aspect of the lip, extending from the gum margin to the free border of the lip. Case referred by Dr. J. D. McEachern, Winnipeg. We decided to try radium and on March 12, 1921, under ether anaesthesia, we introduced two 12½ milligram needles, one on either side of the mass. These were left in position for 7½ hours, on May 25th, a 10 milligram plaque was applied for half an hour to the skin surface. Recurrence of the deformity will not take place for radium damages the delicate endovascular endothelium and obliterates the vessels. It is a very gratifying result.

On Saline Purgatives.—Pharmacologists have repeatedly pointed out in connection with the use of saline cathartics that probably moderately dilute solutions would be more serviceable than the concentrated ones commonly used. The latter are preferred because of the lessened time required to drink a disagreeable bitter dose; but unless the removal of an excess of water from the tissues is one of the ends sought, such laxatives should always be subsequently diluted by an adequate water intake. Hatcher and Wilbert have pointed out that one especial advantage which natural mineral waters have over the solutions of purgative salts, as usually employed, is that they are very dilute, and the patient is thus required to consume a fairly large amount of water with them. This advantage can be secured so easily, however, by attention to the proper dilution of purgative salts that it is not sufficient to justify the expense of the natural waters.—*Jour. A. M. A.*, June 24th, 1922.

EMBOLISM OF THE ABDOMINAL AORTA*

C. F. Wylde, C.B., M.D.

Montreal

EMBOLISM of the abdominal aorta has been discussed by various writers, and it is generally agreed that chronic endocarditis with a resultant mitral stenosis is most frequently the cause of this accident. In such a diseased condition of the heart, with narrowing of the mitral orifice, partial stasis and production of eddies in the blood current, the formation of mural thrombi on the more or less diseased endocardium of the left auricle is facilitated. These thrombi may be flat or polypoid. A portion of a thrombus may become detached in the auricle and by the deposition of blood platelets, fibrin and leucocytes lead to the formation of a ball thrombus, varying in size from a hazel nut to a hen's egg.

It is easy to understand that a portion of either a ball thrombus or a mural thrombus may become detached, and passing into the ventricle through the mitral valve, be carried on through the aorta with the blood stream to become arrested (according to the size of the embolus) in a larger or smaller vessel. They are usually arrested at a bifurcation. That embolism of a comparatively large artery from this source is not more frequent is probably due to the narrowing of the mitral orifice in mitral stenosis, thus preventing a clot of a larger size passing through.

Another source of embolism of the abdominal aorta is acute ulcerative endocarditis, with the formation of vegetations on the valves, chordæ tendinæ, and papillary muscles. A portion of a vegetation may be broken off and pass into the blood stream until arrested, or a portion of a valve or even a papillary muscle may be carried away through ulceration. Among other conditions liable to cause this accident may be mentioned thrombosis of the aorta secondary to a diseased condition of the intima, aortic aneurysm, and the other rarer condition, thrombosis of the pulmonary veins. The common site for the arrest of an embolus in the abdominal aorta is at a bifurcation. It may become a riding embolus, *i. e.* a portion of it extending into both common iliacs causing complete or partial obstruction of one or both of these vessels. Secondary or propagating thrombosis then occurs to some extent upwards, but more extensively downwards, in the occluded or partly occluded vessels.

The onset is usually sudden and attended by extreme pain in the abdomen and lower extremities, and if the obstruction is complete, pulsation in the vessels below the occlusions cannot be felt; the limb becomes cold and bloodless, there is loss of sensation, and gangrene results. The sudden onset of severe pain in the abdomen and lower extremities, anæmia of the limbs with loss of sensation, absent pulsation in the vessels if the occlusion is complete, points to an obstruction of a large vessel. When this is associated with mitral or aortic disease (especially where there is a previous history of rheumatic fever) embolism is more probable than thrombosis. In recent cases of aortic embolism transperitoneal aortotomie with extraction of the embolus after the method of Wahl is recommended by Hesse and it would seem to be the rational method of treating this very fatal condition. Hesse quotes three cases so treated, one of which lived twenty hours, one three days, and one two and a half years.

Welch published in Allbutt's "System of medicine" in 1899 an analysis of 59 cases of embolism and thrombosis of the abdominal aorta. His conclusions showed that in 54 cases the plug occupied the lower end of the aorta and extended a variable distance into the arteries below. Forty-five of the cases were referable to embolism of the bifurcation of the aorta and 14 due to thrombosis; mitral stenosis existed in 20 cases; acute mitral endocarditis in 3; mitral endocarditis in 4; mitral insufficiency without stenosis in 1; thrombi in the left ventricle (mostly without valvular disease) in 8, and large aortic vegetations in 1.

Hesse made further contributions to the literature on the subject by producing in 1921 in "*Archiv für klinische Chirurgie*" an article on embolism and thrombosis of the abdominal aorta. His researches indicated that he had collected 73 cases (including 41 previously mentioned by

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*Read at the fifty-second annual meeting of the Canadian Medical Association, Halifax, July, 1921, but since then has been re-written and enlarged.

Meynard, Roussel, Heiligenthal and Welch), and had added 32 new cases. I am here reporting 2 cases of embolism, and still another case has been reported by Symes-Thompson in the *Lancet*, February 14th, 1914. The cases of embolism and thrombosis thus collected from all sources make a total of 94. An analysis of these cases shows that embolism is the more common condition, occurring in the proportion of about three to one.

Case 1.—I am indebted to Dr. F. G. Finley, Attending Physician to the Montreal General Hospital for permission to report the following case which is a typical illustration of the condition.

M. G. H., Case report No. 265-20;—Mrs. X., aged 48 years, was taken ill on December 31st, 1919, complaining of a fulness of the chest and swelling and pulsation of the neck. During the following week she seemed to be improving, but on January 12th, 1920, twelve days later, she suddenly developed agonizing pain in the right groin, back and down both lower limbs. During the next three days the pain in the left leg improved, but the right continued very painful, becoming gangrenous on January 15th, and she was admitted to the Montreal General Hospital on January 18th.

Personal History.—Twenty years previous to the present illness the patient had an attack of acute rheumatic fever when she was confined to bed for three months. Every succeeding two or three years she gave a history of heart trouble with symptoms of failing compensation which necessitated confinement to bed. One year previous to her last illness she had an operation for acute appendicitis, and made an uneventful recovery. For about two months previous to this last illness she had almost daily attacks of shortness of breath and faintness.

"On admission to hospital on January 18th patient was found to be suffering very great pain in right groin and both lower limbs, requiring frequent doses of morphine to control it. Breathing was laboured; temperature 100.2; respiration 22, pulse 114; eyes were closed, pupils reacted to light and accommodation; the teeth were poor, the tongue was coated, the mucous membranes pale; the lungs were apparently clear; the heart dulness was increased, extending 16½ cm. to the left from the mid-sternal line. There was a marked thrill; the sounds were forcible and there was a presystolic murmur at the apex. Pulse was very irregular. The abdomen was slightly tense, more so on the right side, no mass could be felt. Right leg was gangrenous from about midway between the knee and the foot; sensation was diminished as the line of demarcation was approached, below this it was absent. There was great pain just above the line of demarcation. On the left leg no patellar reflex could be elicited; sensation was definitely diminished below the knee, and the patient could not tell whether a blunt instrument or a pin was used."

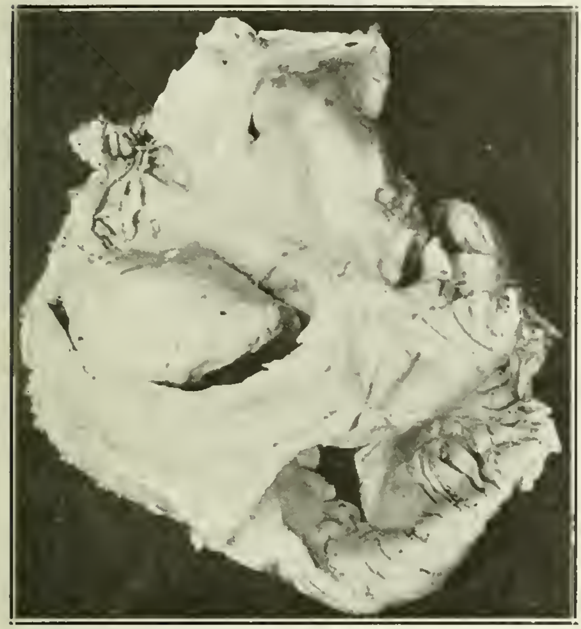
The condition was diagnosed as partial obstruction of both common iliacs, most marked on the right side. On January 21st, nine days after the initial signs of obstruction, under spinal anæsthesia, the right leg was amputated by the circular method, about one hand's breadth above the knee. At first there was no flow of blood from the femoral artery, but after a few seconds a thrombus was expelled and this was followed by a gush of blood. Patient improved after the amputation and the temperature and pulse dropped. Morphine was frequently needed to ease the pain. The wound did not heal. On February 12th the patient had two attacks of severe pain in both lower limbs, requiring morphine. At this time there was sensation of pins and needles in both legs and the pulse could not be felt in the femoral or other vessels of the left leg. There was progressive weakness with evidence of a terminal pneumonia; the patient died on March 6th.

Autopsy.—Amputation of right lower limb through lower third of thigh, recent; emaciation; mitral stenosis; mural thrombosis left auricle; hypertrophy and dilatation of left auricle; passive congestion of pulmonary area; in right hilus a small patch of pneumonia; a propagating thrombus from cœliac axis above (partial) to iliac branches below; no canalization; extensive infarction of kidneys; infarction of spleen; no growth from specimen of heart blood.

In this case a portion of the mural thrombus in the left auricle had evidently become detached and passing through the mitral and aortic orifices into the aorta had been arrested at its bifurcation. A part of the embolus extended into each common iliac and caused complete obstruction in the right leg and partial obstruction in the left. A portion of the embolus in the right common iliac had broken off, passed down into the right femoral, obstructing it, and leading to gangrene of the leg which necessitated amputation.

Case 2.—Another case practically identical with the one above mentioned occurred at the Montreal General Hospital in the year 1890 in the service of the late Dr. James Bell, Attending Surgeon to that institu ion. The autopsy was performed by the late Dr. Wyatt Johnston, Pathologist at that time to the same institution, and the specimen obtained was placed in the Pathological Museum of McGill University. I am indebted to Dr. Maude Abbott, Curator of the Museum for the details and illustrations of this case.

M. G. H. Surgical Case Book F XV, p. 109:—Mrs. Y., aged 44 years, was taken ill suddenly on February 25th, 1890, after a fit of anger, complaining of loss of power in both lower limbs which became numb, cold and paralyzed. The right limb soon recovered power but the left was tender, very painful and gangrene rapidly developed. She was admitted to the Montreal General Hospital on March 3rd, 1890.



CASE II A—14.2420—Large ball-thrombus blocking auriculo-ventricular orifice in mitral stenosis. Remains of mural thrombus in left auricular appendix.

From a specimen in the Pathological Museum of McGill University, presented by Drs. James Bell and Wyatt Johnston.

Personal History.—There was a history of alcoholism; of rheumatic fever thirteen years previously, and of several attacks of tonsilitis. There had been repeated attacks of cardiac weakness with loss of compensation for the last eighteen or twenty years.

Condition on Admission.—There was hoarseness and a sense of uneasiness about the chest. The right leg was cold and pulse could not be felt in the popliteal artery. Sensation was normal: there was no discolouration. The left leg was tender, very painful and gangrenous. A line of demarcation had formed above the left knee. The radial pulse was rapid, weak and irregular. The patient died on March 9th with agonizing pain in the left leg.

CASE II B

Autopsy.—Chronic mitral endocarditis and stenosis; dilatation and thrombosis of left auricle; secondary embolism and propagating thrombus of left external iliac and femoral arteries; gangrene of left foot and leg; acute synovitis of left knee; nutmeg liver; induration of the lung; hæmorrhagic infarcts; embolism of kidney.

The source of the embolism was seen to be a large globular ball thrombus which lay in the left auricle occluding a stenosed valve. (See Illustrations Case 2, A, and Case 2, B). This ball thrombus had evidently broken free sometime previously from a thrombus mass in the left auricular appendix, ragments of which still remained attached *in situ.*

SHOULD THE SANATORIUM LABORATORY DO COMPLEMENT FIXATION AND OTHER SERUM TESTS AS ROUTINE MEASURES*

A. H. W. Caulfeild, M.B.

Toronto

So that you may from the outset prepare your criticism my answer is in the affirmative. I feel however, that no paper on this question, nor the citation of examples, which I am now in a position to give in hundreds, will convince you. Even the routine application of serological data in the examinations of your cases may not, *if* you expect to interpret the results in tuberculosis as you have been accustomed to do in syphilis.

In syphilology, the introduction of the spirocheta means syphilis: there may be delayed or irregular appearances of the different stages, but in practically one hundred per cent. syphilis follows. There is no term, clinical syphilis, as we apply that adjective clinical in tuberculosis.

In tuberculosis, in contrast to syphilis, the introduction or implantation of the tubercle bacillus means, a little less than 100% freedom from the *disease* of tuberculosis: to be more exact one per cent. active disease, one per cent. quiescent or inactive (Framingham reports 1); doubled let us say, because not all are exposed, and we have 96% freedom from *disease*. As a rider to this in tuberculosis we accept the belief that implantation means 100% tuberculous *infection*.

Now a serological test such as a positive complement fixation never necessarily means disease but it always does mean a biological response on the part of the host to some antigen, whether introduced from without or within (exogenous or endogenous). If you inject foreign proteins you will obtain complement fixation to those proteins used as antigens. In syphilis it has been found that a very large percentage of cases give complement fixation *i.e.* the Wassermann reaction to certain antigens. Consequently we infer the presence of the disease and on this basis make the diagnosis.

By injecting extracts of, or killed tubercle bacilli, we obtain complement fixation with those bodies and the serum of the injected animal. But this does not mean that the host has tuberculosis—it cannot; but it does mean that the host has reacted to certain integral portions of the injected bacilli. May I here re-present the contrast between tuberculosis and syphilis in that the implantation of the bacillus rarely (in terms of percentage) means the production of what we call clinical tuberculosis. The inference is, I think, obvious; the positive tuberculo complement fixation result never necessarily means the clinical disease, and must be interpreted in a different manner than is our custom with the Wassermann results in syphilis.

Before I suggest the manner—as I see it—of interpretation in tuberculo-serology, let me refer you to a chart published by Opie and Anderson. (2) From this I will attempt to persuade you to the view that at any rate we need further diagnostic methods.

CHART I

X-Ray of lungs at post-mortem	No. of Autopsies	Conjectured clin. tbc
No calcified lesion	7	?
Positive lesion group 1.	28	X
" " " 2.	41	X +
" " " 3.	7	X +++
" " " 4.	3	X ++++
Total	86	

(After Opie and Anderson: the conjectured clinical tuberculosis column has been added).

Chart I. illustrates the lesions of pulmonary tuberculosis as portrayed by X-Ray plates taken at post-mortem of cases dying from all causes other than tuberculosis. The different groupings from 1 to 4 represent increasing degrees of involvement. While defined by Opie in his paper, it is I think, sufficient for our purposes to state that the amount of involvement found in group 4 was very considerable.

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*Read before the meeting held by the Department of Soldiers' Civil Re-establishment, March 13-16, 1922, for consideration of problems incidental to tuberculous and non-tuberculous pulmonary diseases.

(Referring to Chart 1.) For any given number of people, one can surmise that by the time the anatomical involvement has reached the extent designated in group 1, a certain number of cases of clinical tuberculosis will have developed: further, that the percentage of clinical tuberculosis from this group on will be in inverse proportion to the decreasing percentage of what one may call spontaneous arrests as depicted in groups 2, 3 and 4. As the wave of anatomical involvement increases, fewer proportional instances are found of arrested lesions, and one can believe from our clinical experience that the number of cases showing clinical manifestations of the disease increases. To convey this idea graphically in chart 1, I have used the sign ? as indicative of the conjectural number of cases of clinical tuberculosis which might develop withal preceding demonstrable calcification: the letter x together with plus (+) signs to indicate that the ratio between spontaneous arrests or cures and clinical tuberculous involvement is in inverse proportion.

Opie and Anderson make the following observations,—"In many instances the X-Ray plate demonstrates that the individual has suffered with tuberculosis which would have been recognizable at some time during life had suitable diagnostic measures been employed." They further state that, "the distinction between latent and clinical tuberculosis———has no other basis than the limitations of diagnostic methods and the tendency of tuberculosis to recovery."

It is to be remembered that these X-Ray pictures obtained at post-mortem represent the aggregated results of the activities of the tubercle throughout the life of the individual, and that the entire anatomical involvement may have been achieved, at one period or at interrupted periods of time. During these periods —non clinical remember—positive serological data are as likely, (possibly more likely) to be obtained as throughout the course of the clinical disease. If such immunological data do indicate bacillary activity we have the means of introducing preventive medicine in the field of tuberculosis.

The pathological involvement as depicted in groups 1 and 2, would not with certainty be diagnosed by stereo plates taken during life, and further we know that clinical disease will on rare occasions be brought to the attention of the first physician consulted only after the anatomical involvement far exceeds that of group 4.

My contrast with the Wassermann reaction is finished in furnishing you with possible interpretations of serological data as regards tuberculosis by these deductions drawn from the prevalence of tuberculous lesions as found at post-mortem.

I have spent a great deal of the short time at my disposal in presenting the view, that results in tuberculo-serology show specific reactions on the part of the host to tuberculous products, and that this data must be incorporated with that afforded by other methods of investigation (clinical and radiological) in the formation of one's final opinion. The serological data must be interpreted through its own etiological considerations. I would ask you if our clinical or radiological data is without etiological modifications? You would not dispense with the X-Ray to-day although there are many practitioners in medicine who, still without personal experience of the stereogram of the chest and dependent upon the radiologist's reports, doubt its great practical value.

My further remarks will deal with both the inhibitive and tuberculo-complement fixation reactions. Despite the fact that no laboratory but my own has published data regarding the former I feel it is futile to discuss the value of fixation when both are available—as futile as it is to discuss the value of the flat as against the stereo plate. This conviction is strengthened by the conversion of my four clinical colleagues, the majority of whom began with distinctly antagonistic attitudes regarding the practical value of the t.c.f. reaction by itself.

I believe the proof of any interpretation of serological results in tuberculosis will lie in the continuous application of the tests for long periods of time on large groups of suspected and positive tuberculous, and on clinical normals,

Before presenting some of the more marked percentage results obtained amongst such groups, it seems necessary to outline in rather dogmatic fashion the following collective and condensed interpretations which we at the Toronto clinic apply to our serological data.

Regarding the inhibitive reaction it can be said that:

(1) A 1st or 2nd class result indicates at the time an activity of some type on the part of the bacillus, to which the host is reacting favourably.

(2) A 3rd class or negative result is found:

(a) in normals at the moment free from this type of activity.

(b) in many cases of tuberculosis at the time not doing well: to split hairs, suffering from those types of activity to which the host does not respond favourably.

(c) certain cases of tuberculosis probably doing well without that type of activity to which biological response is necessary.

There is thus a varied interpretation possible with the inhibitive reaction results. While they bear little relationship to the extent of the pathological lesion but do to the degree or type of activity as regards clinical progress, the dual interpretation with the 3rd class and negative should be stressed.

Regarding the tuberculo-complement fixation it can be said:

(1) Not all cases of clinical tuberculosis give a positive result.

(2) A percentage of all stages and types (anatomical and clinical) give it in varying degrees from a doubtful to a so called four plus reaction.

(3) Once the reaction is firmly established it is liable to remain for a considerable period of time: In this respect it is in marked contrast to the tendency of the inhibitive reaction to change.

The results of both tests tend to supplement each other when considered with previous (serological and clinical) data and the present clinical aspects of the case.

The application in diagnosis is different from that in definite cases of the disease.

In diagnosis positive serological results are to be interpreted as meaning response by the patient to tuberculo-products; it is for you as clinicians to correlate this information with other data in deciding whether the case is one of clinical tuberculosis, or should perhaps be kept under observation, even some restrictions of activity. Do you not interpret suspicious radiographic findings differently in different cases,— depending upon the clinical aspects. Use to an extent the same methods with your serological data.

In definite clinical cases variations in serological results indicate responses on the part of the patient to activities of either the bacillus or the lesion. The results in consideration with past data may suggest nothing, may merely confirm your tentative conclusions, or may give strong indication of relapse or subsidence which can be translated into practical changes in treatment.

One more point I can not too strongly urge. Do not expect to obtain distinctive serological findings under the clinical classifications with regard to volume of disease such as incipient, moderately advanced, or far advanced. They are etiologically not adapted to this type of standardization. They are immunological guides in the routine examination and handling of your cases. Follow your cases with routine serological data and I feel sure you will be convinced. For this a serological laboratory should be on the premises; forwarding sera out of town is not satisfactory.

CHART II

126 combined serological tests carried out on 65 students since February '21 (Wassermann negative in all) Stereograms taken in all.

		Per Case.	Per Test.
t.c.f. reaction	persist. neg.	38 cases 58%	74 tests 59%
	persist. weak pos.	11 cases 18%	
	variation between neg. and weak pos.	14 cases 22%	
	persist pos.	5 cases 7%	11 tests (3 cases strong pos. always) 9%
inhibitive reaction	persist. neg. or 3rd class	61 cases 94%	122 tests 97%
	2nd or 1st class once	4 cases 6%	4 tests (2 cases tested only once 3%
	repetition of 2nd or 1st class	0 cases 0%	
combined	2nd or 1st class and pos. t.c.f.	0 cases 0%	
	Tuberculin sensitiveness	persistently negative	25 cases 38%
		positive	45 cases (5 cases or 7% negative to 1st test) 62%

Cases found absolutely negative to 1-20 mg. O.T., the amount which has been used intracutaneously, were given on their next appearance 1-2 mg. intracutaneously. It was in this manner that the five cases were found to be positive on the 2nd test.

Before referring to the percentage results depicted in charts 2, 3 and 4, I would like to comment on what may be termed the positive findings of the serological data,* that is weak and strongly positive t.c.f., and 1st or 2nd class inhibitive reactions with regard to their specific or to their accidental character. I feel they are to be regarded:

(1) as the result of activity within the tuberculous lesion, or

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*The t.c.f. results have for our present purposes been divided into (1) negative, (2) the doubtful or weaker degrees of fixation, and (3) the positive, and strongly positive: The inhibitive reaction into (1) negative and 3rd class and (2) 2nd and 1st class results.

(2) as due to experimental error.

The grounds of experimental error are;

(a) False reading of the test tube result or,

(b) because of some non-specific factor in the serum tested.

Before deciding that these positive results obtained in normals are entirely due to experimental error and bear no etiological relationship to a recent or present tuberculous lesion, one must completely discount the results of Opie and Anderson, of Griffith (3), and others.

Chart 2 shows the results obtained in one group of normals. It is intended to follow these students throughout their five years at the University. Already a number of interesting possibilities have presented themselves which are however better appreciated when more elaborately charted.

The most practical features are:

1. The comparative few which have been persistently negative with the t.c.f. test, showing that with the weaker grades of this reaction diagnostic interpretations must be made with the greatest reservation.

2. The small percentage of positive results with either strong fixation or 1st and 2nd class inhibitive results.

3. The entire absence of either repeated positive inhibitive (2nd or 1st) results or the combined results of both tests.

Chart 3,* is fairly self explanatory and shows the contrast of the results obtained with the different groups selected. The diagnostic value of a 1st or 2nd class (*i.e.* positive) inhibitive reaction, when repeated or when combined with any degree of fixation is the most marked comparative feature. This is emphasized by the fact that only 38% of the parenchymatous group give the stronger degree of fixation, and because of the very limited value of any weak fixation in diagnosis. Including all degrees of fixation 82% were positive in the parenchymatous group, but the majority of these results were of the weaker type, which for diagnostic purposes must be considered in relationship with the frequency of weak fixation in the normal group.

CHART III

		Normal 65	400 routine cases 20% Non Tbc. (80)	 24% Parch. (X-Ray) Tbc. (98)	38% Inhib. 1st or 2nd
Inhibitive reaction	1st or 2nd class....................	(4) 6%	(6) 7%	(50) 51%	(152) 38%
	Repeated 1st or 2nd...............	0%	1%	54%	20%
Combined reaction	1st or 2nd with pos. t.c.f............	0%	3%		47%
t.c.f. reaction	Strongly pos.......................	7%	2%	38%	15%
	Strongly pos. but not always........			24%	
	Any degree persistently absent......	58%	50%	18%	

CHART IV

98 Parch. (X-Ray) 24.5%	Average test per patient...2.2
	Maximum " " " ...7.0
Min...........56 (57%)	
Mod. Adv.....34 (35%)	
Far Adv....... 8 (8%)	
Inhibitive	Correlation
3rd or neg....48 (49%)	Undecided.............. 12
	Apparent fulfilment....... 31
	" " +..... 5
1st or 2nd...50 (51%)	Undecided................ 3
Repeated...15 } 27	Apparent fulfilment....... 31
	" " +..... 16
with pos.t.c.f.22 } (54%)	
(weak t.c.f.. 18)	

In chart 4, a contrast is afforded of the greater prognostic value of the 'positive' inhibitive to the 3rd class and negative results. In the questionnaire which we are using correlation between the serological data (as we interpret it) and the course of the disease is summarised as 'undecided', as 'apparent failure' and as 'apparent fulfilment'. Fulfilment when of leading significance in the case is stressed by the sign +. The percentages obtained in this regard are given in chart 4. Because these cases are all parenchymatous positive it is difficult to label any as affording evidence of failure except for example in those instances where an exacerbation can not be detected clinically when a positive inhibitive result has followed previously obtained negative results in an arrested or cured case. These instances are likely to be labelled as undecided. A series of negative serological results are very unlikely in any 'doubtful' case which does not in this course of time develop demonstrable pathological lesions. Consequently such results will often support an exclusion of tuberculosis or maintain the completely arrested character of the lesion.

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*The data in charts 3 and 4, have been obtained from summaries which are being compiled of the histories at the Department of Soldiers' Civil Re-establishment Chest Clinic, Toronto. A full analysis of these will be published as soon as possible.

A few of the chief features in the 152 case group (*i. e.* 1st or 2nd class inhibitive results, chart 3), have been worked out and are as follows. Frank tuberculosis was finally diagnosed in 113 or 74% of the cases: previously tuberculous in 7 or 4%: possibly tuberculous (diagnosis doubtful) 23 or 15%: non tuberculous 8 or 5%.

In the 113 cases of frank tuberculosis 54 or 48% gave positive X-Ray evidence of a parenchymatous lesion: the extent of this being minimal 27, moderately advanced 18, far advanced 3. Four cases of the 113 were not X-Ray but had positive sputum.

In the 152 cases the correlation between the course of the disease and the serological findings were as follows:—Apparent failure 12 or 8%, meaning thereby that the suggestion afforded by the serological results were not verified clinically: undecided 26 or 17%: apparent fulfilment 88 or 59%: and fulfilment of extreme clinical value 26 or 17%. The two subdivisions of fulfilment total 76%. An individual analysis of the apparent failures, or the citation of examples in which the serological data correlated with or prognosed the clinical course, is beyond the scope of this paper. The value in general is I hope exemplified in the different percentages obtained by the analyses.

1.—Armstrong, D. B. Four years of the Framingham demonstration. *Am. Rev. Tuberculosis*, 4, 12, p. 908 (February) 1921.

2.—Opie, E. L., and Andersen, Hans. First infection with tuberculosis by way of the lungs. *Am. Rev. Tuberculosis*, 5, 8, p. 670 (October), 1921.

3.—Griffith, A. S. An enquiry, based on a series of autopsies, into the occurrence and distribution of tuberculous infection in children, and its relation to the bovine and the human types of tubercle bacilli respectively.

Reports to the Local Government Board of Public Health and Medical Subjects. H.M. Stationery Office, New Series No. 88, 1914.

The Alleged Insusceptibility to Intoxication by Poison Ivy.— With the advent of the season when rhus dermatitis, following contact with poison ivy, becomes common, a recrudescence of the myths regarding the effects of this plant is certain to ensue. The failure of many persons to exhibit symptoms following apparent exposure to toxic species of rhus has presumably been responsible for the widespread belief that some individuals are not susceptible to the poison. An investigation by Brown in the Department of Pharmacology at the University of Minnesota justifies the conclusion that there is probably a personal variability in susceptibility depending on temperature, condition of the skin, and many other factors which are not yet understood; 2 but he is also convinced that there is no conclusive evidence of such a state in man as entire insusceptibility to the poison. Contrary to the theory of "desensitization" by internal administration of tincture of rhus, it appears that the susceptibility may be increased with successive intoxications. *Jour. Am. Med Association.*

Toxic Protein End-Products: The Cause of So-Called Inanition Fever.—De Witt H. Sherman and Harry R. Lohnes, Buffalo, claim that the cause of inanition fever is the toxic protein end-products, developed in the intestinal canal. The development of these toxins is due to the lack of ingestion of the carbohydrates dextrin and lactose, which produce an aciduric state, a soil unfavourable to the development of proteolysis, in other words, a soil unfavourable to the development of toxic protein end-products. These fevers are due to proteolytic toxins, and can be easily forestalled by the early administration of the carbohydrates dextrins and lactose. These are food elements which favour the production of innocuous aciduric flora, which in turn inhibit the multiplication of the proteolytic flora, and thereby prevent the formation of toxic protein end-products. The authors suggest that the vague term "inanition fever" be discarded, and the "proteolytic intestinal toxemia of the newborn" be used in its place.—*Jour. Am. Med Association.*

MESENTERIC THROMBOSIS—WITH REPORT OF TWO CASES*

C. B. Parker, M.D.

Toronto

During the last few years a number of articles on the subject of occlusion of the mesenteric vessels have appeared in the literature with reports of numerous cases; the result is that a condition which was once believed to be of rare occurrence is now coming to be regarded as somewhat common, and as something which possibly goes often unrecognized. Some few months ago the writer had within a month two cases of thrombosis one of the inferior mesenteric artery and the other of the superior mesenteric vein; these required surgical intervention, each being admitted as an emergency case to the Toronto General Hospital. As these cases were of considerable interest they are deemed worthy of being presented to this section with a short discussion of the subject.

1st case—Mr. R. G.,—Case No. 50369—Thrombosis of the inferior mesenteric artery. Admitted June 10th, 1921. Discharged August 5th, 1921. Male, age 62. Occupation, boxmaker.

Complaint—Severe abdominal pain of fifteen hours duration.

Previous illnesses—None of importance. Personal and family history—negative. Weight 135 pounds.

Present Illness—Was well early in the morning but was seized with severe abdominal pain shortly after going to work. Pain was sharp and felt generally over the lower portion of the abdomen, and growing worse obliged him to go home to bed. He took castor oil at 8.30 a.m. and a dose of salts at 10.00 a.m., after which he became nauseated and vomited. Later he took another dose of salts, and as the pain became more intense than ever he called a physician, who gave him an enæma. As he had no relief he decided to come to the hospital about midnight.

On admission, he was able to lie on his back but complained bitterly of abdominal pain, and was not able to describe his subjective symptoms.

Examination—Heart not enlarged, systolic murmur present at apex. Arteries markedly sclerosed, and pulse 110 of low tension—Blood pressure 100 systolic, 60 diastolic. Temperature 98.5°. There was a marked purple discoloration of the whole abdomen and of the thighs to the knees. Abdomen—somewhat distended—no respiratory movements and no peristalsis visible. Tender all over but apparently most tender in left lower quadrant. No areas of cutaneous hyperalgæsia. Bilateral boardlike rigidity. Bladder empty. Liver dullness present—no signs of shifting dullness—no mass palpable, but a greater tenseness of the abdomen was felt in the left lower quadrant. Rectal examination—negative.

Catheter specimen of urine, acid, no albumin, no sugar, no indican, S.G. 1012. Microscopic examination—negative. Blood—white blood cells 21,000.

Diagnosis.—The patient was evidently profoundly shocked and suffering from an acute intraabdominal lesion. Volvulus of the sigmoid or mesenteric thrombosis were considered the most probable conditions in the differential diagnosis.

Operation.—Laparatomy at 3.00 a.m. about eighteen hours after onset. Midline incision. Distended coils of intestine with roughened serosa presented. Below this was a large coil of colon, very dark in colour, distended with gas. This gangrenous portion commenced in the descending colon and extended to the junction of the sigmoid and rectum. Above and below this section the bowel was healthy. The gangrenous portion was delivered en masse. An incision was made into the coil and contents emptied. The gangrenous bowel and its mesentery were excised and the root of the mesentery oversewn. The divided proximal end of the descending colon was brought out through a stab wound in the left flank and sewn to the skin with a Paul's tube inserted and ligated in place. The upper end of the rectum was sutured to the surface at the lower end of the incision which was closed with through and through silk worm gut sutures.

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*Read before Section of Surgery, Academy of Medicine, Toronto, Feb 21st, 1922,

Post operative course was complicated by broncho-pneumonia but patient was able to be out of bed in two weeks.

Pathological Report—Material.—Sigmoid colon and mesentery, bluish in colour. Marked necrosis. One artery in the mesentery showed an area of thrombosis, the artery being quite full of whitish yellow translucent material which cut with some resistance and around this area was a red blood clot. Microscopic examination—showed thrombosis of the mesenteric artery with gangrene of the bowel.

2nd Case—Mrs. K. N., Case 50370—Thrombosis of superior mesenteric vein. Admitted July 10th, 1921, died July 11th, 1921. Female, age 40, married.

Complaint on admission (1) constipation, chronic 20 years. (2) constipation, acute, 2 days. (3) pain in abdomen, 3 days.

Previous Illnesses and Family History—Negative.

Present Illness.—Patient has had chronic constipation for the past 20 years, and was taken ill 7 days ago with a more acute type of constipation, necessitating the aid of a physician. Her last bowel movement occurred two days ago (July 8th) by aid of castor oil and enema, when some large hard tar-like lumps of fæces came away. On July 10th in the afternoon, patient was seized with severe abdominal pain, first in the left lower quadrant of the abdomen, but later the pain became generalized extending above the umbilicus. The pain was sharp and very distressing; continuous and quite unrelated to meals. It did not radiate. Patient belched gas, an old symptom now exaggerated. Patient vomited three or four times, a yellowish green fluid. These symptoms not abating, her physician sent her in as acute obstruction.

Physical Examination.—Patient lies flat on back and seems to be in considerable pain. Answers questions well and does not seem to be shocked. Complains of pain in the epigastrium, localizing it vaguely. There appears to be a yellowish tint of jaundice on the face but not on the conjunctivæ.

Abdomen.—Symmetrical, rounded. Very slight movement on respiration. No distension. Palpation-no mass felt. There was slight abdominal rigidity, which was more marked above the umbilicus, equal on both sides. No tender localized area. Percussion negative. Cardio Vascular—pulse 68. Heart sounds normal. Blood pressure—138 systolic 60 diastolic. Reflexes—knee jerks absent. Pupils react normally. Patient belches a little gas. Temperature 101.

Diagnosis.—(1) The jaundice, belching of gas, chronic constipation, suggested disease of biliary tract. (2) The tarry stools suggested ulcer, mesenteric thrombosis or enteritis.

Tentative Diagnosis.—Lesion of upper gastrointestinal tract.

Operation.—Abdomen opened in right rectus above umbilicus. Biliary system apparently normal. Large scyballous masses as big as walnuts in colon. A loop about nine inches long of the jejunum was found the colour of a blood sausage with marked œdema but glistening serosa. The lumen of this loop was obstructed by the œdema. Gangrene had not yet developed. This loop of gut was excised and an anastomosis was made. A wedge-shaped resection of the mesentery attached to the excised gut was made, revealing a large number of venous thrombi. Abdomen closed with drain. Patient received an interstitial saline injection. Pulse on return to ward was 128 and of fair quality. Morphia given. Pulse became soft rate 130. Pituitrin given and camphor. Enema relieved distension. Patient became restless, pulse rose and later became imperceptible. Patient had received 110 ounces of saline by the intersitial method. She died about 24 hours after operation.

Autopsy Report.—Abdomen contained about a pint of reddish fluid. A great part of the intestine was bluish, but the peritoneum had still its lustre. This discolouration of bowel commenced, at the site of the anastomosis and extended down to within 12 inches of the ileo-cæcal valve. Appendix and gall bladder were free of disease. On tracing the vessels of the abdominal cavity an ante-mortem thrombosis was found to exist at the junction of the splenic and superior mesenteric veins. This extended along the splenic vein almost to the spleen, on in to the portal vein as far as the liver, and down the superior mesenteric vein, running into its tributaries to all the coils of the small intestine. The thrombosis had apparently started in the splenic vein above the junction of the superior mesenteric vein and the splenic and was probably due to inflammation in the pancreas. The tail of the pancreas and hilus of the spleen were matted together. This mass was in close proximity to the end of the thrombosis near the spleen.

Liver.—On section thrombosis was found to extend up into the vessels inside the liver. The surface was somewhat yellowish with darker areas.

Spleen.—Large, considerable pulp on scraping.

Anatomical Diagnosis.—(1) Thrombosis of splenic veins, splenic-mesenteric veins and portal vein. (2) Pressure on junction of superior mesenteric vein and splenic vein by head of pancreas. (3) Mass, probably inflammatory in tail of pancreas involving spleen. (4) Nephrosis of both kidneys. (5) Endometritis. (6) Passive congestion at base of both lungs.

Microscopic findings.—Lungs—marked œdema—some areas of broncho-pneumonia. Heart—normal. Uterus — normal. Pancreas—vessels show antemortem thrombosis, part of pancreatic tissue degenerated, some increase of intralobular connective tissue, some lymphocytic infiltration (evidence of old inflammation). Spleen — normal. Kidney — some degeneration of proximal tubular epithelium—some passive congestion. Ovaries — normal. Suprarenals—normal. Liver—areas of degeneration of liver cords which are irregular in shape, nuclei do not stain and cytoplasm is light staining, some vessels thrombosed.

Etiology.—There are about 500 cases of occlusion of the mesenteric vessels recorded and of these about half are of arterial and half of venous origin. The arterial blood supply of the intestine is from four sources—the cœliac axis, the superior mesenteric, the inferior mesenteric and the middle and inferior hæmorrhoidal arteries. There is free anastomosis of the superior and inferior pancreatic-duodenal arteries and the middle and left colic arteries and the terminals of the inferior mesenteric artery and the middle hæmorrhoidal,

Experimental work on animals has shown that the collateral channels are incapable of supplying blood in sufficient volume to maintain life in the bowel if the superior or inferior mesenteric arteries are ligated. It must be admitted, however, that a few observations are on record where the anastomotic channels were sufficient to overcome the effect of ligation of one of these main arteries, though in the vast majority of cases intestinal infarction occurred. In the dog ligation of the superior mesenteric artery is followed by violent contractions of the intestine with anæmia which persists for two or three hours. This spasm is doubtless an important factor in the prevention of collateral circulation from the anastomotic channels.

In man the causes of obstruction of the mesenteric arteries are embolism, thrombosis secondary to sclerosis of the arterial wall, or a combination of the two.

Venous obstruction is more complicated and occurs almost invariably as thrombosis, though retrograde embolism has been described.

Thrombosis of the mesenteric vein may ascend from thrombosis of its radicals due to an inflammation of the appendix, the pelvic organs, or the anal region or it may descend from a thrombosis occurring in the liver, gall bladder or pancreas, as a result of inflammation.

Intravascular clotting may occur apart from sepsis and is apt to occur after operations in which veins are transfixed, as for example, in the suturing of the omentum. In addition to these more common causes there are many others recorded such as, thrombosis commencing in strangulated hernia, ulcers of the intestine, intussusception, abscess of mesenteric glands, breaking-down carcinoma, phlebitis of the lower extremities, prostatic abscesses, and cirrhœsis of the liver.

Symptoms.—The outstanding symptoms are (1) pain and tenderness (2) collapse (3) vomiting (4) bloody stools (5) distension (6) obstruction.

The most common symptom is pain which is sudden and severe and usually of a cramping character, the cramps succeeding each other with shorter and shorter intervals of relief. The pain at first may be localized but soon becomes general, and is accompanied by collapse. Vomiting at first reflex soon becomes continuous, through the development of obstruction. Soon after the onset the patient may pass several stools and in from 30-40% of cases the stools contain blood. This sign when present with the other symptoms renders the diagnosis almost certain. Within a few hours after onset abdominal distension becomes manifest most frequently with absolute obstruction and an acompanying peritonitis.

Examination of the patient will usually show general tenderness though in some cases it may be localized to the affected area. Palpation may enable one to feel a fixed coil of intestine but is not well tolerated by the patient on account of his pain and tenderness. Rigidity if present, is of the voluntary type unless peritonitis has already occurred.

Careful palpation of the abdomen on the operating table with the patient anæsthetised, should always be practised before the incision is made, as it is then often possible to detect abnormalities that are quite impalpable with the patient conscious and his muscles on guard.

Diagnosis.—The association of these symptoms and signs with cardiac disease to account for arterial embolism, particularly mitral stenosis and malignant endocarditis, or vascular disease to account for arterial thrombosis—or their occurrence in a patient who has recently had an abdominal or pelvic inflammation or operation, should lead to an early diagnosis. Too much time should not be expended considering the diagnosis, for action is necessary if life is to be saved. What Roswell Park says about acute abdominal crises is particularly true here *viz.*, "In the presence of sudden acute symptoms which include intense abdominal pain, collapse and rigidity of the abdominal wall, very little time should be lost in speculation as to the cause of the lesion."

Prognosis. The length of gut implicated is the primary consideration in giving a prognosis, the length of time since the onset and the condition of the patient are of less importance. Nine cases of spontaneous recovery of well authenticated cases of mesenteric thrombosis are on record and twenty-four successful resections have been recorded apart from the case described. The condition therefore has a mortality of approximately 93%.

Treatment.—All cases should be operated on as soon as possible—and the affected bowel either resected or simply delivered outside the abdominal wall. Shock should be combatted by the use of light gas-oxygen, combined with local anæsthesia, and rapid work. Interstitial infusion of saline supplies the dehydrated tissues and the use of warm applications to the abdomen conserves bodily heat, and protects the function of the liver. During the operation, if the intestine is markedly distended it may need to be emptied. Enough bowel must be removed to insure a sufficient blood supply to the remaining intestine. If resection of the upper part of the small intestine is required axial union is better than side to side.

Some Conditions Controlling Internal Secretion.—No one, says W. B. Cannon, Boston, may now question the great influence of the glands of internal secretion on important physiologic processes. There appears to be a tendency just now, however, to pay these glands not only respect, but also deference, homage and a blind worship. The physiologist regards the body as a system of organs, each performing its service, each influenced by other organs and capable in turn of influencing other organs, and each having a use and a value only in relation to the others. Questions now arise regarding the real status of the glands of internal secretion. If they have not the dominant position commonly assumed for them, how may they be subordinated? What influences can be brought to bear on them in such a way as to modify their activity? These are important questions to have answered—important because of the profound effects which the ductless glands themselves are capable of exerting. Cannon presents some of the evidence for physiologic control of the internal secretions. He points out that bodily functions are managed by a system of checks and balances—by mutual adjustments, such as those between antagonistic muscles, and by maintained equilibria, such as those between material income and outgo, and between acid and base in the blood. If the endocrine glands are regarded as the regulators of important physiologic processes, normally they are well regulated regulators.—*Jour. Am. Med. Association*, July 8th, 1922.

Calcium Lactophosphate in Cyclic Vomiting.—Green (Med. Record, January 14th, 1922) calls attention to the value of calcium lactophosphate in cyclic vomiting and severe migraine. Two cases are recorded, a boy of 7 and a girl of 8, who suffered from severe attacks of cyclic vomiting every two or three months. After a prolonged course of calcium lactophosphate, in 2-grain doses three times a day, no further attacks occurred for more than a year. In adults suffering from migraine, 5 grains three times a day taken over a considerable period have markedly relieved the symptoms, and its value is urged in those cases of periodic vomiting and severe migraine which resist all other attempts toward permanent relief.

Case Report

BILATERAL CARCINOMA OF BREAST

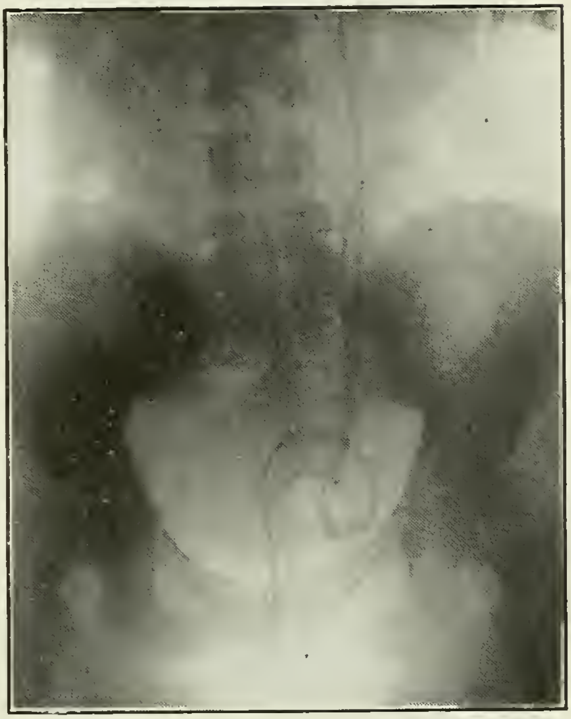
Drs. Webster and Hooper

Ottawa

Mrs. E. S., age 45, presented herself complaining of "lump" in breast. It was first noticed two years ago on sight of old abscess. Past few months became more noticeable, dull pain and ache. Family history negative. Past history generally healthy, married, has had children. Examination showed well nourished woman, looked older than age stated. Heart and lungs negative, abdomen neg., urinalysis neg., haemoglobin 80 per cent., R.B.C. 5,000,000. Hard mass size of an egg upper and inner quadrant left breast, skin retracted, mass slightly adherent to deep fascia, gland at border of pectoral muscle palpable; no other glands. Diagnosis of scirrhus carcinoma made and operation advised.

In course of routine examination a hard nodule, size of a walnut, moveable, was found upper and inner quadrant very near nipple, right breast, no glands palpable, clinically this was considered malignant.

Operation was done in a few days. Left breast, axillary contents and pectoral muscles removed from above down. Pathologic report showed "Chronic mastitis diffuse, with scirrhus carcinoma in one area. Glands not affected."



Second Catheter Pointing to Retro-Caecal Abscess

Patient made an uneventful post-operative recovery. Later on she returned and right breast, axillary contents and pectoral muscles removed. Pathological report stated. "Some areas show marked fibrosis. One nodule shows a condition of fibro adenoma. There is a definite cystic change, in places contents chocolate coloured. In one place there is a papillomatous change in cyst, and I would regard it as early cancerous development."

At the present time she is receiving radium treatment as a follow up. Is in good health.

Myocarditis and its Management—The whole subject of treatment of myocarditis is condensed by William A. Jenkins, Louisville, Ky. (*Journal A. M. A.*, June 24th, 1922), as follows: (1) There are no specifics. (2) Drugs are secondary in importance to the other measures mentioned in this paper. (3) Much will depend on the physician managing the case, on his skill and ability to collect, summarize and properly evaluate all of the various and intricate factors entering into the case. If any benefit is obtained, it will be secured by working along these general lines: (*a*) all measures that will tend to make easy the work which the crippled heart has to do should be adopted. (*b*) Appropriate use should be made of all measures that will tend to combat, or retard, the progress of the degenerative changes. (*c*) The judicious use of remedies which will stimulate or act directly upon the cardiac muscle itself is demanded.—*Jour. Am. Med. Association,* June 24th, 1922.

Retrospect

ON TONSILLECTOMY; AND ITS AFTER EFFECTS

A DECADE has scarcely passed since tonsillectomy replaced tonsillotomy. During the past few years it has become the operation always chosen when dealing with diseased tonsils, and has proved of undoubted benefit in improving nutrition in a large percentage of those cases in whom such an operation was clinically indicated. For the first few years the operation was attended by a mortality rate that deterred many from recommending it. Great improvements in the surgical procedure have however been made, and under skilled hands and with proper precautions the mortality percentage may now be regarded as almost negligible. Many physicians, however, have questioned whether the removal of such an important mass of glandular tissue may not be followed by some untoward after results.

The tonsils are found in all animals from the reptilian stage up to man, but in man they are much more complicated than in the lower animals. It is therefore probable that they possess some function, even although the nature of the function has not been established. Nevertheless, the injurious effect which diseased tonsils may exert in undermining health is now recognized by all. The dangers are lest we overestimate the benefits that may result from the removal of tonsils showing only a slight hypertrophy which, under improved conditions may subside or in the hope of doing away with an infection arising from other foci.

In a recent paper read by Dr. Kaiser, of Rochester, N.Y., before the Section on Diseases of Children, at the last annual session of the American Medical Association, "On the effect of tonsillectomy on the general health in five thousand children, we have presented to us the first careful study of the after results from this operation. An annual opportunity for the study of the problem was offered in a special clinic where approximately ten thousand children were operated upon during a period of five months, and re-examined in a year's time. By co-operation five hospitals in Rochester made it possible for every child in that city to have the operation performed under the most favourable conditions. An organization was formed and fifty thousand children were examined for signs of trouble arising from enlarged or diseased tonsils. Every child in whom such signs were found was given a very complete physical examination in which special attention was given to the general nutrition, to the presence of any glandular enlargement attributable to infection from the tonsils and to the condition of the ears and of the lungs. When there was any doubt as to the advisability of the operation the child was declined. Before any arrangements were made, a careful history was obtained from either the mother or nurse, and all complaints which might be referable to a diseased condition of the throat were noted. The most important of these were mouth breathing, frequent sore throats, frequent colds, enlarged cervical glands, ear trouble, frequent attacks of fever, and joint pains or growing pains. These reports were carefully tabulated, and were afterwards arranged in four classes. In the first were placed children with definitely hypertrophied tonsils who presented clinical evidence of infection. This class comprised 73 per cent of the total. A second class comprised children who with little apparent hypertrophy showed signs of some infective process. This class contained $22\frac{1}{2}$ per cent. A small class comprising only $3\frac{1}{2}$ per cent. of the total was formed by those with hypertrophied tonsils and adenoids, but without any clinical evidence of infection. A few amounting to only 1 per cent appear to have been operated upon who presented neither abnormal tonsils nor evidence of infection.

The operations were performed in the morning by skilled laryngologists, and every precaution was taken to ensure the safe recovery of the child. No directly fatal result occurred, but some undesirable complications followed the operation. Post operative bleeding took place in a number, but in no instance was there any failure to control it. Febrile reactions in a few cases ensued, usually due to a coincident respiratory infection. Eight children afterwards developed diphtheria, of whom three died, owing to the fact that it was recognized too late for an effective employment of antitoxin. Eight developed pneumonia. Five children out of the ten thousand operated upon developed a lung abscess. Catarrhal and purulent otitis media as an after sequence occurred in about one per cent. of those operated upon, but there was no mastoid involvement. About two per cent. of the children suffered a considerable loss in weight subsequent to the operation, but all regained this loss in a few weeks time.

At the end of a twelve month five thousand of these children were carefully re-examined. The greatest improvement occurred in the group that showed evidence before operation of obstruction and infection. Considerable improvement in general health was noted in the group that presented evidence of infection due to the tonsils, but in whom there was no marked hypertrophy. No marked change was found in the general condition of those children operated on for hypertrophy only. In a few of the 5,000 operated upon, improvement in nutrition was rapid. In 29 per cent. malnutrition still persisted, indicating that enlarged or diseased tonsils are only one of many factors interfering with normal nutrition. Considering the group as a whole mechanical relief from obstructive symptoms, freedom from many subjective symptoms, definite mental improvement, and a lessened incidence of sickness, was the report given by 83 per cent. of the mothers. It is noteworthy, however, that in a few children new complaints developed after the operation. While enlargement of the cervical glands existed in 43 per cent. of the children operated upon, 55 per cent. of these were free from such enlargement when examined at the end of the year. On the other hand 22 per cent. of the children who had been free from this symptom before the operation showed definite glandular enlargement when re-examined later. Twenty-five children complained of attacks of epistaxis, a troublesome ailment which had not occurred previously. Laryngitis and bronchitis developed in a number who had been previously free from such complaints. Rheumatic fever developed in two who had been operated on. It is perhaps too early to state definitely whether tonsillectomy does protect against the common infections. It was noted, however, that the incidence of diphtheria and scarlet fever among those operated upon appeared to be much less than that among other children in the city, but the incidence of mumps, of pertussis and of chicken pox was higher.

In Dr. Kaiser's report the necessity for a careful preliminary examination was emphasized if the surgeon would avoid accidents. Two instances in the same city of a fatal issue following the operation occurred in children who had not had a careful preliminary examination. It must also be remembered that the removal of diseased tonsils does not remove other important sources of infection frequently met with, alveolar abscesses, sinusitis, pyelitis and an unhealthy state of the intestinal tract. If the operation is undertaken, it should be done thoroughly by a trained specialist. Incomplete removal of all diseased tissues while removing obstructive symptoms may fail to relieve signs of infection. It must also be remembered that after the acute catarrhal and influenzal infections so frequently met with in children during the spring and autumn months, enlargement of the tonsils may occur and disappear under improved health and more genial weather without operation.

Adenoids are similar in tissue and are closely associated with the tonsils in all infective processes, and their enlargement often calls more imperatively for their removal than does that of the tonsils. In a recent investigation carried out in the University of Illinois (*Proc. Inst. Med.*, Chicago, 3, 195, 1921), Pilot, Isadore and Pearlman found that adenoids in a similar degree to the tonsils were to be regarded as foci liable to harbour dangerous micro-organisms, and Hambrecht and Negum (*Arch. Int. Med.*, May, 1922) report that the bacteriological findings in cultures made from excised adenoid tissue followed closely the findings of cultures from the tonsil of the same patient. In 218 patients reported previous to operation as clinically in need of tonsillectomy, microscopic examination of the excised tonsils gave evidence of a pathological condition in 93 per cent. In this 93 per cent., haemolytic streptococci were present in 96.1 per cent., and were present as the predominating organism in 85.4 per cent. In the 7 per cent. of normal tonsils haemolytic streptococci of all types were present in 28 per cent., pneumococci in only 14 per cent, and staphylococci, and many heterogeneous organisms in 58 per cent.

Chronic lacunar tonsillitis was the most frequent pathological condition found occurring in 42 per cent. chronic interstitial tonsillitis in 21 per cent.; chronic peri-tonsillitis in 6 per cent.; abscess in 10 per cent.; lymphatic hyperplasia was the only change met with in 4 per cent. In nearly every instance the same organisms were isolated from the adenoid tissue as from the tonsillar tissue.

Although removal of the tonsils and adenoids reduces greatly the number of bacteria in the nasopharynx it does not cause their disappearance. Examinations of normal throats revealed the same groups of organisms, but in greatly lessened numbers; from which it may be concluded that these bacteria are a part of the usual floral of the nasopharynx. The presence of the haemolytic streptococci in such large numbers is stressed by these investigators as most important. The rôle of these organisms as the active causative agent of many clinical conditions is well established, especially in respiratory affections, while the ability of these bacteria to produce lesions in the stomach, gall bladder, appendix, and endocardium secondarily to the primary foci of infection in the tonsils is affirmed by many authorities. An interesting report (*Brit. Med. Jour.*, June 3, 1922) of a severe epidemic of tonsillitis in a public school in England, which was followed in a number of instances by an attack of acute appendicitis, was quoted in a recent address by Lord Dawson of Penn. A. D. BLACKADER.

Acute Barbital Poisoning.—Boenheim relates that among the 286 cases of acute poisoning in Sick's service at Stuttgart in thirteen recent years, acute barbital (veronal) poisoning formed 5.7 per cent. of the whole. The drug had been taken with suicidal intent, and five died. These had all taken over 10 gm.; up to this amount the prognosis is not grave, although no specific antidote is known. Even with large doses of the drug, complete restitution may occur. Rosenberger, by promptly rinsing out the stomach, saved a patient who had taken 30 gm. of phenobarbital. The main symptom with barbital poisoning is the drowsiness to the deepest coma. Other features are the instability of the temperature, and the tendency to pneumonia. The latter almost inevitably proves fatal. There is no vomiting; the digestive tract does not seem to suffer. The main point of attack is the peripheral circulation. The drug seems to paralyze the walls of the capillaries so that vasomotor disturbances are constant. This may entail secondarily pulmonary edema. The suspicion of morphin poisoning is discredited by the good respiration and pulse, and the fact that the pupils react well to light. The play of the pupils, dilating and contracting at brief intervals, is characteristic. The absence of the abdominal reflexes, with retention or exaggeration of the tendon reflexes, is also instructive. Likewise the rapid shifting of the phenomena. The barbital can be detected in the urine. Caffein injections may be required. The danger is past after two days, provided pneumonia or pulmonary edema does not develop. *Brit. Med. Jour.*, June 3rd, 1922.

The Potency of Commercial Vitamin Preparations.—Owing to the rapid growth of the traffic in commercial vitamins, E. V. McCollum and Nina Simmonds, Baltimore, examined some of these preparations for their potency as sources of the most stable of these, the water-soluble B or vitamin B, the antineuritic substance. Any one who is familiar with the chemical properties of the vitamins knows that there is little prospect of making concentrated preparations of any vitamin, other than water soluble B, which contain any more active substance than is obtainable in certain foodstuffs that are easily procurable. It is, in fact, the water-soluble B or antineuritic substance that is most promoted commercially. The antiscorbutic substance, the vitamin C, is so unstable that it would seem to be impracticable to obtain it in concentrated form for use as a substitute for fresh vegetable foods, which are, in general, very rich in it. The authors have tested six of the products for vitamin B which have been more or less widely advertised, and they present the results of their studies. An examination of the labels on the containers of the vitamin preparations studied suggests at once that their promotion for therapeutic purposes represents a repetition of the "patent medicine" frauds which have for so long been perpetrated on the American public. Thus, the same list of symptoms that were listed on the sarsaparillas, blood purifiers, kidney remedies, remedies for female weaknesses, etc., reappear as conditions for which the vitamin preparations are said to be specific remedies.—*Jour. Am. Med. Association*, June 24th, 1922.

Editorial

THE ADDRESS IN MEDICINE

IN selecting the theme for his address, Dr. Barker showed a keen sense of one of the weak aspects of medicine of the present day. The address calls for serious consideration by all thoughtful physicians. It presents a problem which they must face if they are to keep abreast with the advances being made in practical medicine. Although the subject is a difficult one it is to be hoped the address will receive careful study by all physicians, especially by those responsible for the training of the men and women who are to take up the burden a few years hence. Dr. Barker has given a clear leading worthy of his scholarship and wide knowledge of the ancillary sciences that will have an increasing influence on the practice of medicine of the near future. Two observations by way of suggestion may be offered. The first is that unusual and difficult words should, as far as possible, be eschewed. An address, especially one delivered before a general audience, so far as consistent with the author's purpose, should be readily understood by his hearers, so that the closest attention may be given to its subject matter.

The second observation refers to the continuance of old terms which no longer signify that which is intended to be conveyed. This is true of "disposition" and "predisposition". These terms were clearly applicable to the old pathology, but are not so to the new, at least so far as infectious diseases are concerned. The tissue liable to be invaded and destroyed by a microorganism is no more "predisposed" to it than is the prey in the animal world to its destroyer. The chief objection to continued use of these terms is that they obscure where they should make clear the thought so as to leave no room for uncertainty. Clarity of language is important to all by inculcating clearness of thought, especially for the student entering on his course of training. While these criticisms are not vital, still they suggest desirable changes more easily attained if led by one so deservedly influential as the author of this able address.

A. McPhedran

THE METABOLIC RATE AND THYROID DISEASE

DR. HOWARD in an article published in this number of the *Journal*, calls attention to an interesting series of cases presenting most of the clinical features of Graves disease, although the eye symptoms were either absent or less pronounced than usual. There existed in all these cases, however, a discrepancy between the expected and the actual basal metabolic rate, only two of twelve cases giving a rate of plus 14 and 15, the others being within the normal plus or minus 10.

With an enlarged thyroid and typical thyroid symptoms in each case, it is difficult to believe that this gland can be excluded as an important element in the causation of the syndrome, and it throws doubt on the basal metabolic rate as the deciding factor in the diagnosis. The value of this test has proved so great in Graves disease and in toxic adenoma that it must be regarded as a standard procedure, and one on which the surgeon largely depends in selecting the period for operation. Dr. Howard's results agree with those of other recent observations, and the evidence points at present to a series of cases in which the metabolic rate presents an unexpected normal figure.

In coming to a conclusion, the clinician, whilst welcoming the various laboratory tests, must not be unduly influenced by them. He must weigh all the evidence in forming his opinion, and especially that obtainable from knowledge gradually accumulated over a long period of years by careful and accurate clinical observation.

CANCER OF THE BREAST

IN the fight for supremacy over cancer two tactical plans are being employed. Firstly, along the lines of research, experimental and clinical, investigators are striving to determine the pathogenesis of the disease and its etiology. Much time, labour and treasure have thus far been expended with but a modicum of result and that of a negative rather than of a positive significance. Secondly, and because of the failure of the first, the attempt is made to combat the disease by *early diagnosis*, adopting as a working hypothesis that the best known method of treatment is early and radical removal by the knife. An early diagnosis depends upon, the education of the public to seek medical examination and advice upon the first discovery of any signs or symptoms; also upon the education of the medical profession in methods of examination which may lead to the recognition of those conditions which, from the evidence of our past experience, would appear to be the precursors of, or to predispose to cancer. Having discovered such a condition the physician must have the honest courage to place the facts squarely before the patient. Here is no place for "sympathetic" consideration of the patient's feelings or the trial of "conservative" methods of treatment. Both smack of falsity and of weakness. The truth, as we understand it, must be expressed with candor and firmness and if necessary with almost brutal directness. "Conservatism" either in expressed opinion or in advised treatment so often results in delay with ultimate loss of life.

With special reference to cancer of the breast, Sir George Lenthal Cheatle stands forth as an apostle of this doctrine. For years past he has been laboriously studying such conditions as chronic mastitis and cyst formation and the relation of these to cancer. His writings on this subject may be found in the *Brit. Jour. of Surgery*, 1920, Vol. VIII; Nos. 30 and 31; 1921, Vol. IX, No. 34.

But recently he speaks still more boldly in the *Brit. Med. Jour.*, June 3rd, 1922. In this article he deals with what he terms "the prœmial breast". This term he defines as indicating a condition of the breast which makes it a prelude to later developments of papillomata, simple or malignant, or to other forms of cancer. He regards the term as more accurate than the terms "pre-cancerous" "precursory", etc. He describes the clinical signs and symptoms and defines the differential diagnosis from nodular breasts of physiological activity. He insists that failure is so frequent even after supposedly early recognition of cancer of the breast and its radical and skillful removal, that surgeons must not adopt an attitude of "passive contentment with present treatment".

He draws a parallel between the radical treatment of the prœmial breast in the prevention of breast cancer and the treatment of leukoplakia in preventing cancer of lip or tongue, or of the appendix once inflamed in preventing general peritonitis. He is convinced that the prœmial breast is a definite pathological entity with grave possibilities and in support of this contention he cites cases in which he had diagnosed "prœmial breast" which upon serial section revealed microscopically malignant disease already present but not discernible clinically.

As already surmised by the reader he advises total removal of the breast and includes the pectoral fascia and the pectoral group of the axillary glands. In his technique he leaves the nipple but warns against the danger of infection unless care be taken. In our opinion this is an aesthetic weakness which is inadvisable. Surely a woman who consents to removal of the breast because of a threat to her life does not expect to retain the nipple, or may even be disturbed by discovering that what is a portion of this "almost cancerous" breast still remains with her.

The article quoted demands careful reading and supplies much food for thought in directions other than those of its defined sphere of "cancer of the breast".

PAPERS AND PROGRAMMES

WHILE we believe all those present at the meeting of the Association in Winnipeg returned home with the satisfaction of having spent three pleasant, interesting and profitable days in the young metropolis of the West, it was a matter of regret that one or two of the sectional meetings did not fill their whole promised programme, owing to the failure to be present of some members of the Association who had promised to read papers. This failure formed the subject of discussion at one of the meetings of the Council, and the opinion was expressed strongly that the promise to read a paper at the Annual Meeting should be regarded as a definite contract not to be lightly defaulted; and that when the author of a paper failed to be present at the time allotted to his paper, his paper should be read by title only. One member went so far as to characterize such defaulting as a habit with some: this we regard as too strong a statement. Promises are given months ahead of the date of meeting, and with professional men unforseen hindrances to the fulfillment of a promise frequently arise. A man of dominant personality once wrote, "for to will is present with me, but how to perform I find not." Many a physician in active practice will sympathize with St. Paul's lament. To express blame too strongly may make many hesitate to attempt a task which should always involve much thought and time: a good paper is not prepared in a day. Papers presenting interesting thoughts and facts in clear concise language, so that those listening may easily appropriate all the important statements, put the Association under a definite indebtedness to the writer. Long papers presenting few or no new thoughts in tedious, inconsequent diction are a definite strain on any audience, and detract much from the interest of a meeting.

In the arrangement of programmes it is always desirable to have as many new interesting thoughts and facts presented in the allotted time as may be possible. Twenty or even fifteen minutes is a long time for the presentation of the important facts in any paper. In many societies, papers are ordered to be read in abstract; the essential facts only are given, and more time is allotted for the discussion in which fresh points are often elicited, adding greatly to the value of those emphasized in the paper. Of still greater advantage is the plan adopted at the meetings of many English and American societies, in which a brief resume of every paper to be presented is placed in the hands of the members a few days before the meeting. This permits those interested in the subject to come prepared to join in the discussion. We believe that in this way more interest would be taken in the several papers, new thorghts would be elicited, and all the members would receive more benefit.

Men and Books

PALÆOPATHOLOGY

THE study of the pathology of past ages, and the various diseases affecting man in the early periods of history has a special interest to physicians of the present day, and adds much to the picture of life in those prehistoric days. Until recently our knowledge of disease in the early days has been confined to the study of the lesions found on examination of the bones in mummies. Sir Marc Armand Ruffer, who unfortunately lost his life at sea while returning from a mission to Saloniki in 1917, devoted many years to the examination and study of mummified material placed at his disposal by the Egyptian government, when the building of the great Assuan dam threatened the inundation of important ancient burial places in Egypt; during these years he devised methods for the successful microscopic study of the soft tissues of these mummies. This made it possible to learn of other diseases than those revealed in the bony structure. Fortunately all his work has not been lost to science as the appearance of an imposing but most interesting volume by his widow indicates. Egyptian embalmers after careful evisceration of their subjects evidently relied mostly on the dry climate and the hot sandy soil to preserve the remaining skeletal tissues. Some bodies, however, escaped the embalmers, and considerable visceral material was obtained from these bodies preserved only by the desiccating powers of the Egyptian climate.

From this material we learn how little many of our more common diseases have altered during the past 5,000 years. The Egyptians of those days suffered from arthritis deformans at a much earlier age, and to a far greater degree than we meet with it now, possibly because peridental infection was not only very prevalent but occurred in severe form. Sufficient knowledge to combat this troublesome affection did not exist, and the prehistoric dentists of whom we have read, appear to have done little excepting pull teeth and very imperfectly fill cavities. Even cave bears and a crocodile, which basked in the sun some 900,000 years ago, have been found crippled with arthritic anklylosis of the vertebræ. A hump backed priest of Ammon assures us of the occurrence of Potts disease arising from tuberculous infection several thousand years before the Christian era. Pneumonia has been demonstrated in many of these old mummies as the fatal lesion, with bacteria still in a stainable condition. Bilharziasis attacked the urinary tract in those days as frequently as it is met with in Egyptians in the present day, and arterio-sclerosis was a common pathological lesion. Achondroplasia, rickets and tuberculosis produced skeletal deformity notwithstanding the fact that the climate appears to have been as dry and sunny as it is now. Evidently many Egyptians became stiff and old by the time they reached the age of fifty years. Even royalty suffered from very bad teeth and infected gums. Baldness was common. A few of their queens have been found almost bald, and the younger princesses permitted the presence of nits in their hair. The existence of syphilis, however, at that early date has not been demonstrated. Food habits appear to have varied during the several ages, and among the different classes of the people. Abderhalden found that the tissues of mummies after 3,000 years were still well enough preserved to yield amino-acids when hydrolyzed, and to permit the recognition of autolysis which had taken place after death; free amino-acids, cholesterol, and fatty acids were found present in the muscular tissues; Hansemann in his examination, found the proteins so little altered in a mummy 5,000 years old that they gave the specific precipitin reaction. On this continent the *Journal of the American Medical Associatian* informs us that Prof. Moodie, of the University of Illinois, has investigated not only pathological conditions, but also specimens of early geological times and has succeeded in finding evidence of bacteria in the mesozoic age. An interesting example was the discovery of evidence of a pathological lesion in the tail of a dinosaur.

A. D. BLACKADER.

Therapeutical and Pharmaceutical Items

IRON AND AMMONIUM CITRATE

It has been noticed that iron and ammonium citrate on the market varied greatly in solubility and in the frequency with which precipitates occurred when made up in solution. Consequently, an experimental examination was made. Nine samples in all were obtained. As iron and ammonium citrate dissolves in half its weight of water, 10 gm. of each sample was agitated in a mechanical shaker with 5 cc. of water. The specimens were examined at frequent intervals.

No. 1.—Large, ruby-red scales. Solution time 10 mins.; 1:20 dilution muddy; heavy precipitate in 3 weeks.

No. 2.—Small granules, dark ruby-red. Solution time 12 mins.; 1:20 dilution dark red, clear, transparent; fairly clear with slight ppt. in 3 weeks.

No. 3.—Very small fine scales with rather an orange tint. Sol. time 20 min. 1:20 dil. like 2; fairly clear with slight ppt. in three weeks.

No. 4.—Very small fine scales, lighter red than 1. Solution time 28 mins.; 1:20 dilution like 2; fairly clear with slight ppt. in 3 weeks.

No. 5.—Fairly small, fine, green scales. Solution time 30 mins.; 1:20 dilution pale yellowish green; fairly clear with slight ppt. and same color as the others in 3 weeks.

No. 6.—Scales smaller and browner than 1 and not so transparent. Solution time 35 mins.; 1:20 dilution like 2; very clear with slight ppt. in 3 weeks.

No. 7.—Scales like 6. Solution time 35 mins.; 1:20 dilution like 2; muddy, with ppt. in 3 weeks.

No. 8.—Smaller than No. 7 but same color. Solution time 40 mins.; 1:20 dilution like 2; fairly clear with trace of ppt. in 3 weeks.

No. 9.—Scales about same size as No. 7 but lighter red than 1. Solution time 40 mins.; 1:20 dilution lighter and more of a yellowish red than the others. Clearest of all, but with slight ppt. in 3 weeks.

A very common prescription consists of iron and ammonium citrate and epsom salts solution, consequently the above were tested as follows:—Iron and ammonium citrate was dissolved in its own weight of water and 5 cc. of this solution was mixed with 5 cc. of a concentrated solution of magnesium sulphate. At the end of four days there were slight precipitates present in all the samples, but in no case was this greater than the precipitate present in the solution of the citrate alone.

The attention of the prescriber may be called to the fact that the laxative effect of magnesium sulphate can be replaced by sodium sulphate with a very marked improvement in the flavour. A concentrated solution of sodium sulphate was tested with iron and ammonium citrate in the same way as above and with the same results. J. Deas, *Dept. Pharmacy, Univ. of Toronto.*

Acetylsalicylic acid is notoriously insoluble in water. Alcoholic solutions are not suitable under all conditions for administration.

Sodium citrate (1), using four times the weight of acid, has been suggested as a means of overcoming the insolubility, but the original assertion that the drug was not decomposed in this solution has been found to be in error. Leech titrated a mixture of 18 gms. acetylsalicylic acid, 72 gms. sodium citrate and 500 cc. water with normal alkali. The titrations were made over a period of sixteen days. His results show that at the end of four days 50 per cent. of the acetylsalicylic acid had been decomposed, in nine days 75 per cent., and the entire content at the end of seventeen days.

When given in solution with sodium bicarbonate or carbonate or any of the alkalies, this result occurs even more rapidly; if given in powder, bicarbonate may prevent the acid irritating the stomach without decreasing the action of the drug.

The most efficient method of administering acetylsalicylic acid thus appears to be in powder, cachet or tablet form, the first preferred, unless, of course, one desires only the products of the decomposed mixture, i.e., sodium salicylate, etc.

The addition of the "acetyl" ring to the salicylic radical adds greatly to its value in relieving pain. In this respect the acetylsalicylic acid is superior to the sodium salt. The acetylsalicylate is excreted as such in the urine.

References:

1.—*The Prescriber*, June, 1921, p. 247.
2.—*J.A.M.A.*, 78, Jan., 1922, p. 275.

F. W. W. Hipwell,
Depart. of Pharmacology, Univ. of Toronto

The Association

RESOLUTIONS ADOPTED AT WINNIPEG MEETING

On Income Tax

Moved by Dr. Argue seconded by Dr. Hart and resolved: "That whereas, in the compiling of income tax returns both the Dominion and the respective Provincial Governments allow as a legitimate deduction certain monies expended by a merchant in travelling to the mercantile centres for the purpose of buying, and whereas this is considered a reasonable and justified deduction, and whereas a physician who attends a *bona fide* medical conference or post graduate course of instruction is not allowed this necessary expenditure,

"Be it resolved, that it is the opinion of the Canadian Medical Association this is a proper and reasonable expense, and that it should be allowed as a deduction in compiling income tax returns of a regular practising physician, and that a copy of this resolution be forwarded to the Minister, and to the various Provincial Medical Associations. Carried unanimously."

Moved by Dr. Blake seconded by Dr. Smith and resolved: "That the Canadian Medical Association in session assembled recommend to the Minister of Finance that 10 per cent. of the income of the medical profession be exempted from income taxation over and above the usual exemptions extended by the Act to afford the medical profession a similar consideration extended to manufacturers."

Amendments to By-Laws

Chapter 7, Section 6 the first sentence to read as follows:

"In order that the business of the Association may be facilitated during the interval between its annual meetings the Council shall appoint a Committee to be known as the Executive Committee, and which shall consist of (a) Seven members appointed by the Council from amongst its members and (b) Two representatives from each province to be appointed by the Executive of the Provincial Association and who should be chosen from amongst the members of the Executive."

Chapter 8, Section 1 the last sentence to read as follows:

,,Four members of the Committee shall constitute a quorum for the transaction of the business."

Chapter 3, new Section (6).

"That when, and wherever the Canadian Medical Association meets in each of the Provinces, the Meeting shall be held in conjunction with the Provincial Organization, and that the local organization shall have control of the arrangements, and as far as possible, the preparation of the Scientific Programme."

1921 FINANCIAL STATEMENT

20th January, 1922

DR. J. W. SCANE,
Secretary, Canadian Medical Association,
Montreal.

Dear Sir:—We beg to report that we have completed the audit of the books and accounts of the Association for the year ended 31st December, 1921, and attach hereto Statement of Cash Receipts and Disbursements for the period under review.

We have verified the Bank Balance and seen satisfactory vouchers for all disbursements.

The books were in good order, every assistance was given us in the carrying out of our work, and our requirements as Auditors were fully complied with.

Yours very truly,

McDONALD, CURRIE & CO.,
Chartered Accountants.

CANADIAN MEDICAL ASSOCIATION

Statements of Receipts and Disbursements for Year Ended 31st December, 1921

RECEIPTS

Annual Fees	$13,551.49
Advertisements	11,266 31
Reprints	1,629 05
Illustrations paid by Authors	186.54
Premium on American Funds	168.21
Interest on $1,000 00, 5% Ritz-Carlton Bond	75.00
Sundry Sales of Journal	209.09
Sundries	23.50
Overdraft in Bank—31st December, 1921	2,707.51
	$29,819.73

DISBURSEMENTS

Overdraft in Bank—1st January, 1921			17.02
Journal Account—			
Printing		$15,843.79	
Illustrations		961.34	
Murray Printing Co., on account Morang		1,200.00	
Agents' Commission		2,084.27	
			$20,089.40
Reprints			1,399 74
Montreal Medical Journal Co.—Payments to Stockholders, $5,000 00 at 6%			300 00
General Expeuses—			
Auditors' Fees		35.00	
Bonus to Dr. Scane (May 1920-December 1921)		250.00	
Legal Fees		51.25	
Postage and Petty Cash		355.00	
Salaries		4,636.50	
Stationery and Printing		357.32	
Telephone and Telegrams		65.95	
Travelling Expenses—Associate Secretary		285.00	
Sundries		45.57	
Bank Charges:			
Collection of Drafts	151.50		
Interest on Overdraft	134.94		
Exchange on Cheques	32.49	318.93	
			$ 6,400.52
Halifax Conference—			
Committee of Arrangements		$ 135.00	
Travelling Expenses		245.05	
			$ 380.05
Purchase of Canadian Medical Monthly			1,233.00
			$29,819 73

Unrecognized Infections in Production of Carriers of Pathogenic Organisms.—Charles F. Craig, Washington, D.C. (Jour. Amer. Med. Assoc., September 10, 1921), deals with the subject of the contact carrier, the one who has been in contact with the patient and who presents no appreciable symptoms of disease. While it is generally believed that contact carriers have never suffered from the diseases due to the parasites they are carrying, Craig calls attention to the fact that a very considerable proportion of them have presented, at one time or another, symptoms which were undoubtedly due to the parasite they carry. While there is no question that many individuals who have never shown any appreciable symptoms of infection become carriers of pathogenic organisms, it is equally true that many so-called contact carriers have, in reality, suffered from symptoms of infection, and are, in effect, convalescent carriers rather than contact carriers of the specific parasite. This class of carriers originates from unrecognized cases of contagious or infectious disease, cases in which the symptoms of the infection were so slight or atypical as to mislead the physician, or cases that have caused the patient so little inconvenience that medical advice was not sought. A considerable proportion of contact carriers belong to this category, and the recognition of this fact is of value to the physician, as it should lead him to a more careful consideration of apparently trivial symptoms and to greater utilization of laboratory aids in the diagnosis of their cause. Craig urges more frequent employment of blood cultures and microscopic examinations of the blood in cases of undetermined fevers; of throat cultures in the apparently mild inflammations of the throat and nose; and of microscopic examination of the fæces in patients suffering from diarrhœa and other intestinal symptoms, to detect these infections and prevent their spread.

Fatigue and Malnutrition of Children.—Veeder cites two cases to illustrate how fatigue alone may be responsible for failure to gain weight and develop along normal lines. The question of sleep is very closely bound up with the subject of fatigue and malnutrition. While it is absolutely impossible to lay down fixed hours for each age and, further, so many variables enter in, as the place of sleeping, sleeping equipment, general physical condition of the child, the amount of physical exercise or work the child performs, and the like, that latitude must be allowed and common sense used. But Veeder believes there is a minimum, and he has arbitrarily fixed a minimum table, based largely on the amount of sleep of physically fit children, and in practice it has been fairly satisfactory. From one to two years, thirteen hours; from two to four years, twelve hours; from four to six years, eleven hours; from six to ten years, ten hours; from ten to fourteen years, nine hours. As a matter of fact, most children take more. But a normal, active child who takes less is on the danger line so far as normal development is concerned.—*Jour. Am. Med. Association*, September 3rd, 1922.

Abstracts from Current Literature

SURGERY

The Injurious Effects of Early Extraction of Teeth.

Simon, Bela. Budapesti orxosi ujsag, February 16th, 1922.

The too early removal of the milk teeth and some of the permanent teeth is an injury which is not easily rectified. It necessitates a revision of the indications for extraction up to the twelfth year, and the danger is, first, to the milk teeth and then to the permanent molars. It is easy to undervalue the importance of milk teeth because they fall out so early, but the length of time before the next set appears must be remembered. The first permanent molar may become carious or pulpous and because it is very difficult to treat the pulp in a 6 or 7 year old child, the parents often have the tooth extracted. The physician should explain to the parents that the first permanent molar is not a temporary milk tooth. It appears at six years of age and does not take the place of a milk tooth. Generally speaking, this tooth is large, the prominences are pointed and intact and the sulcus is well developed. Removal of this tooth removes the function of the opposing tooth. Chewing surface is lessened by a third when a second milk molar is extracted and the results of insufficient chewing are well known.

The configuration of the face depends on the condition of the alveolar process and early extraction prevents its full development. This is especially true of the first permanent molar which has a large chewing surface and supports the cheek. This tooth determines the height of articulation when in occlusion with its antagonist. This occurs until the milk teeth fall out and the permanent teeth in occlusion form the same conditions. Conservative treatment should be attempted even without prospect of success as the arrangement of the other teeth depends on the first molar. The dangers of extraction are lessened as the twelfth year is approached. Periostitis is the only indication and this should be prevented by all known measures.

A. T. Bazin

Differential Diagnosis of Salivary Calculi.

Boss, William, Beitr. z. klin. Chir., No. 2, Tubingen, 1922.

A report is made of 8 cases of sialolithiasis, a condition of which there is only 1 case on record before the year 1915. Roedelius made the same observation at the Eppendorf Hospital where he saw but 2 cases before the war and 6 during it. Boss thinks the change in food during and after the war is responsible for the increase. Sialolithiasis is a disease of middle age and is more frequent in the male sex. The most common site is the outlet of the duct of the submaxillary gland. One of Boss' cases involved the duct of Stenson and 5, Wharton's duct. The symptoms of this condition are known: stomatitis which may lead to severe phlegmon of the floor of the mouth, with interference in opening of the jaws and disturbances in nutrition. There are also pyorrhœa salivalis, salivary colic and pus from the red and inflamed outlet of the salivary duct. The characteristic colic which is seen in stone in the duct comes when the obstruction is solitary and the duct completely blocked, thus interfering with the outflow of saliva. The colic may be absent if there are several small stones, as the saliva may find an outlet between them.

Boss recommends sounding of the duct of the submaxillary and lingual salivary glands in all cases of tumour of the floor of the mouth, and puncture of the tumour if the diagnosis is not cleared up with the former procedure. This will prevent many errors in diagnosis. The differentiation between carcinoma of the floor of the mouth and salivary tumour cannot be made by considering the consistency, configuration or relations of the tumour to its base or surroundings. The variation in size is characteristic of salivary tumour and is caused by the accumulation of saliva. It is difficult to demonstrate the stones by X-rays, and the results are not reliable as the shadows of the stones may be covered by that of the jaw and a case is on record in which a carcinoma of the floor of the mouth was mistaken for stone of the salivary duct. Mere removal of the stone is not sufficient, as recurrences are frequent. The gland also should be removed especially in late cases, this recommendation being based on the degeneration and functional changes found in it. The conservative procedure is preferable only in cases of the parotid, on account of the facial nerve and other anatomical difficulties.

A. T. Bazin

Abduction Treatment in Fracture of the Neck of the Femur. *Dorrance, Georg M. and Murphy, Eugene C. Penn. M. J.*, April, 1922.

On admission to the hospital an x-ray picture is taken of the injured member and a stereoscopic view. On the following day the patient is taken to the operating room and given a general anæsthetic. The perineum is brought down against the perineal post, the sound limb is brought out to the side to its extreme limit of normal abduction, the foot is placed in the stirrup where it is fixed, with a moderate degree of traction exerted. The treatment of the fracture depends upon the position of the fragments and the resulting deformity. To correct the usual deformity in a fracture of the neck of the femur, the assistant makes traction downward with a strong pull and the operator makes traction outward in the upper third of the thigh and at the same time manipulates the fragments into position. The limb is then placed in the position of abduction to the same degree as that permitted on the normal side. By this means the neck is brought to a horizontal plane. The capsule surrounds both fragments. The head is fixed in the acetabulum. Consequently the tension of the capsule aligns the two fragments and forces an end-to-end contact. In extreme abduction, the upper border of the shaft fragment and trochanter are opposed to the rim of the acetabulum and the side of the pelvis. The foot is rotated inward in the slightly overcorrected position, the limb is measured and compared with the measurement of the normal limb. If there be no shortening, the foot is placed in the stirrup and fixed in position with firm traction exerted downward. Application is made of a layer of table felt, which has been cut and rolled into bandages. This is applied from about the middle of the thorax down to and including the foot of the fractured side and well down over the buttocks of the opposite side. This spica cast is reinforced on the outer side by a rod of iron, ½in. wide, extending from the upper extremity of the cast to the external malleolus. The inguinal region and the knee are also reinforced, using a heavy wire mesh. The plaster spica is completed in two layers, covering the entire surface, including the foot. A large pad, which is to be removed after the cast has set, is inserted under the felt over the abdomen. After the cast has set, the patient is placed in bed with the head of the same elevated. As soon as the patient is out of the anæsthetic, the cast is trimmed out around the genitals and rectum. A stereoscopic picture of the fracture is taken the following day. A Balkan frame is placed over the bed and a bird-swing placed at the head of the same. This permits the patient to elevate himself for the use of the bed-pan. The cast just above the foot is suspended to the Balkan frame by means of a rope and pulley so that the correct amount of counterpoise will balance the foot in any position. After the third day the patient is changed from side to side. After the first week, if strong enough, he is placed in a wheelchair for a few hours each day. Casts are permitted to remain on patients from 13 to 16 weeks in all patients over 55 years of age. Impacted fractures should be broken up when they interfere with function. A. T. Bazin

Causes and Diagnosis of Pain in the Spinal Column. *Haas, J. and Eisler, F. Wien. klin. Wchnschr.*, February 16th, 1922.

Examination was made of 109 cases of pain in the spinal column with diagnosis as follows: (1) Osteomalacia of the spinal column, 28 cases. There are two forms of this, one in adults and the other in adolescents. In the former the chief complaint is of exhaustion, and of more or less localized pain on pressure; there is also spontaneous pain, especially after movement, often of a neuralgic or sciatic character, and sometimes there is local œdema. The roentgen picture shows atrophy and a deformity of the bodies of the vertebræ in the shape of a biconcave or wedge-shaped change in the profile of the body of the vertebræ. In adolescent osteomalacia the roentgen picture shows kyphosis or scoliosis and accompanying changes in other parts of the skeleton, for example, the epiphyses. Osteomalacia of the spinal column gives almost the same symptoms as the condition described by Schanz as "insufficiency of the vertebræ". (2) Spondylitis deformans, 15 cases. These were all in persons over 40 years of age, and mostly after trauma or long-continued over exertion. The changes in the spinal articulations were similar to those in arthritis deformans of other joints. The roentgen picture showed deformations caused by osteophytes, broadening of the joint surfaces, and a preponderance of hyperplastic processes over the resorptive processes characteristic of osteomalacia. Differential diagnosis from osteomalacia is often made difficult by the fact that the two are combined. (3) Ankylopoietic spondylitis, 11 cases. This begins in early youth and progresses by fits and starts;

in the later stages there is total kyphosis, spastic fixation of the whole spinal column and progressive ossification of the ligaments. In the beginning there is slight, and later, pronounced, atrophy and bone proliferation at the joint processes, with formation of bony processes between the bodies of the vertebræ. Bechterew's disease (14 cases) is not a separate entity, but belongs in this group. (4) Rheumatic spondylitis (2 cases). This can be diagnosed only by exclusion of rheumatic affections of other joints. Roentgen examination negative. (5) Tumour metastases, 3 cases. There is circumscribed sensitiveness on pressure with constant pain. Roentgen picture generally negative; often clear foci. (6) Tuberculous spondylitis, 39 cases. Differential diagnosis is not necessary except in cases where pronounced destruction has not yet taken place. The cases are in young people; there is a dull pain in the lower thoracic and in the lumbar vertebræ; no pain on pressure, no increase of pain if weight is applied in an axial direction; on motion there is spastic fixation. The roentgen picture is normal at first, later there is a slight decrease in the intervertebral space, or wedge-shaped deformity of a vertebra. Pain in the spinal column may accompany diseases of internal organs, such as affections of the bronchial glands, dilation of the aorta, cholelithiasis and nephrolithiasis. A. T. Bazin

Early Symptoms of Spinal Cancer. *Oppenheimer, Edgar E. J. Bone and Joint Surg.,* April, 1922.

Carcinoma of the bodies of the vertebræ is not a very unusual condition. From a study of 32 cases Oppenheimer has concluded that the early signs of root involvement from carcinoma have the following clinical manifestations. The symptoms are these of sensory root irritation as distinguished from a peripheral nerve lesion. What is usually designated as a bilateral sciatica considering the pain and its distribution, will, on careful examination, be found to correspond to one or more roots of the sacral plexus. When the spine higher up is involved, the symptoms are clearly segmental in character; usually other sensations are intact and the motor sphere is involved late in the disease. The pain is always greatly exaggerated by immobilization; is more or less continuous and prevents but does not interrupt sleep as does the pain in spondylitis. These symptoms appear with or without spinal rigidity and are not infrequently present when the radiograph of the spine is negative. They are in themselves not characteristic but should always arouse suspicion and encourage the search for primary carcinoma and, in conjunction with other suspicious signs, often secure the diagnosis. It is often possible to foretell the ultimate vertebral breakdown long before it actually occurs and not so rarely before the radiograph gives positive results. Of these changes, the most typical is slight dislocation forward, so that there appears a more or less definite recession of particularly one or a few spinous processes as they are successively palpated from above downward. In some of the more marked cases the palpating finger suddenly meets with a sharp depression as it reaches the subluxated vertebra. In another group of cases the writer has been able to discover the presence of slight later displacements which only months afterward became pronounced. In still another group, he has been able to demonstrate the compression of the bodies of individual vertebræ as it occurs very early in the disease and before it is apparent in the radiograph, by what he thinks is a change in the relation between the adjacent spinous processes; more often the change in the height of the vertebræ is complicated by a variable amount of torsion. These changes in the contour are not absolute criteria in the absence of other symptoms. They are, however, very suggestive in connection with other symptoms not in themselves definite, and should lead one to suspect cancer, and therefore stimulate a most thorough search for other evidence of carcinomatosis.

An abstract and analysis of 32 cases of carcinoma of the spine seen at the Montefiore Hospital, New York, is appended. A. T. Bazin

Treatment of Hæmorrhoids. *Harbin, R. M. J. M. A. Georgia,* March, 1922.

The usual indications for operation are hæmorrhage, pain, protrusion and itching.' Before operation has been advised, a general examination should be made for bladder tenesmus, stricture or cancer of the rectum. If any impassable stricture of the urethra should exist, troublesome retention of urine may follow. The preliminary treatment is very important, and consists in giving 2 oz. of castor oil at 4 P.M. the day before, and a soap suds enema three hours before operation. The lithotomy position is preferred. Dilating the sphincter muscle should be done with care. In only a very small percentage of cases does Harbin prefer the ligature and excision method, where tumours are very numerous and large, and with some prolapse of the rectum. The great objection to this method is the prolonged convalescence and postoperative pain. In the clamp and cautery method there are no open lymphatics, a fact which to his mind explains the comparative absence of postoperative pain. In his experience it is an exceptional occurrence that morphin is needed. From a review of 83 operations by ligature and excision, and 63 by clamp and cautery, it appears that postoperative comfort and shorter convalescence favour the latter. A. T. Bazin

The Present Status of Epiplopexy. *Gibbon, John H. and Flick, John B. Ann. Surg.,* April, 1922.

In one hundred and five cases collected by Greenough, the mortality within thirty days was 29.5% and the improvements, 42%. Mayo reports twelve deaths in twenty-eight cases, while sixteen were relieved. Moynihan reports one case cured and one relieved out of seven operations. The writers feel that the procedure results in cure in about 10% of cases and in benefit to a much larger number. In the portal type of cirrhosis, biliary drainage, except as the operation produces adhesions, could be expected to do little good and in the biliary type, epiplopexy could hardly produce a cure. The alcoholic cases give the best results and the syphilitic the worst, while Greenough concludes that the hypertrophic type gives better results than the atrophic. In all of the writer's ten cases, the liver was contracted and the results were better the earlier the operation was performed. When the ascites is of slow development, the prognosis is better than when it is rapid. The operation should be as short and simple as possible; two rows of mattress-sutures fixing the omentum to the parietal peritoneum on either side of the midline being sufficient. Gas-oxygen anaesthesia is probably the best. The operative mortality in this series was 20%, one dying of pneumonia and one of peritonitis, both occurring before the above mentioned simple technic was instituted. Most operators have eliminated friction of the liver, spleen, and diaphragm because it causes shock. The reaccumulation of fluid does not mean that the operation has been a failure as many successful cases have been tapped postoperatively.

A. T. Bazin

Intra-Abdominal Torsion of the Great Omentum. *Cano, Julio Oritiz. Cron. M. chir. de la Habana,* January, 1922. P. 158.

A patient, thirty-eight years of age, who had had an inguinal hernia at the age of ted years uncompli cated, cured blenorrhagia, and dyspeptic symptoms lasting for many years, developed loss of appetite, gastric pain which was relieved on the ingestion of food, persistent constipation with excretion of mucous, gastric hyperacidity, and pain on palpation of the umbilicus. Belladonna, valerian, and a suitable dry diet, relieved the pain somewhat; however, it reappeared later. As purgation and belladonna had no effect, and peritonitis was suspected, operation was performed. Incision over the iliac fossa elicited a large quantity of red, serosanguineous fluid; a portion of the omentum seemed greatly congested. A tumour the size of the head of a fetus was found closely attached to the omentum, presenting recent adhesions to the parietal peritoneum and to several coils of the intestines. This growth was isolated and removed. Six catgut ligatures near the colon facilitated the ablation of almost the entire great omentum. Two drainage tubes were left in place. Recovery was uneventful.

A study of the cases in the literature permits their classification into 3 groups: (1) omental torsion without hernia, (2) omental torsion combined with irreducible hernia, (3) hernia devoid of intestinal loop. Of these types, omental torsion without hernia is the least frequent, and is never recognized before the exploratory operation. In all such cases there are adhesions between the epiplon and the pelvic organs, and sometimes associated tumours. It is certain that a direct connection exists between epiploic torsion and inguinal hernia. In cases of irreducible hernia, when the torsion is intrasaccular or parasaccular, the diagnosis is not difficult if omental volvulus is taken into consideration. The sudden onset, the special intensity of the pains, irradiation of the abdomen, and the formation of a hard, tense cord at the level of the internal inguinal orifice, are sufficient to establish the diagnosis. In cases of hernia devoid of intestine, in which there is apparently no relation between the abdominal tumour and the hernia, it will generally be found that the absence of hernial content is of short standing, and that the lesion is due to unskilful reduction of an old hernia. The presence of hernia is the guiding factor in the diagnosis of omental torsion. The condition should always be suspected in the presence of acute abdominal symptoms and hernia, unless it is definitely contraindicated by specific diagnostic signs. A. T. Bazin

Some Preventable Causes of Adhesions. *Willis, Park Weed, Northwest Med.*, March, 1922.

Surgeons have not been sufficiently diligent in taking precautions against adhesions that may follow abdominal surgery. These occur so frequently as to warrant attention to any means that may tend to prevent them. Willis has been called to several cases in which adhesions could have been prevented by a little care. In the case of a patient upon whom an emergency operation had recently been performed, he found that in the hurried closure of the wound (owing to the patient's condition) a portion of small intestine had been caught and fastened to the wound by sutures, causing a more or less general peritonitis and a fecal discharge from the wound. Shortly afterwards he handled the case of a man upon whom gastro-enterostomy had been performed a few months before. Upon opening the abdomen he found that the peritoneum had retracted for some distance on either side of the wound, and the stomach was over a considerable area adherent to the abdominal wall between the edges of the peritoneum. Evidently, approximation of the peritoneal wound had not been secured at the time of operation. The omentum is particularly likely to slip under an abdominal stitch and, by fastening to the line of incision, this necessarily makes an adhesion. The surgeon should always take sufficient time to make a careful closure. He should use as much care in this respect as he expects the nurse to use in the counting of sponges. The worst adhesions Willis has ever encountered, except in cases of tuberculosis or malignancy, were in a case where the only explanation lay in the supposition that the water used in sponging had been too hot. These adhesions were located away from the seat of the old operation, and the surgeon who had formerly operated admitted they were probably caused by a large, hot, wet pack used to keep the intestines out of the way. Since that time, the hospitals in Seattle are trying to arrange a uniform system for use of thermometers, so that the surgeon may know exactly what temperature he is using. Some patients are much more susceptible to heat than others. In the use of hot water, the temperature should never be above that which would be non-irritating to any patient.

A. T. Bazin

MEDICINE AND PATHOLOGY

Experimental Investigations on the Physio-Pathology of Arterial Blood Pressure. *Marassini, A., Arch. di fisiol.* 1920. *Arch. per le sc. med.*, 1921.

The writer has studied the blood pressure in compensating intravenous injections of saline solution. He finds that the salt solution injected after corresponding abstractions of blood does not restore the former level. However, where a great deal of blood is removed and the salt solution substituted in its place, the blood pressure does not attain the former height but may be maintained at a sufficient level to preserve life. If the blood-letting is repeated many times and the blood loss compensated with an equal volume of 0.7 per cent. sodium chloride injected through the jugular vein (in dogs), the average blood pressure becomes lower each time. If the salt solution be injected in relatively larger quantities so as to increase the total amount of circulating fluid, the blood pressure reaches very high levels, but only temporarily, descending to one which is out of proportion to the quantity of injected fluid. The lower the hæmoglobin index and the higher the blood pressure, the greater is the quantity eliminated from the circulation, of the fluid injected for compensating a great loss of blood.

The important point is that, if the blood extractions are moderate in quantity and frequently repeated, and if the blood lost is compensated each time with an equal volume of physiological salt solution, the average blood pressure undergoes progressive diminution.

C. F. Martin

Intracardiac Injection of Adrenalin for Syncope after Administration of Chloroform in Infancy. *Bliedung C. Münchener Medizinische Wochenschrift*, January, 1922.

The article is interesting as informing us of the first case where intracardiac injection of adrenalin has been able to restore life.

The patient treated had been placed under chloroform anæsthesia for a short operation on the eye, during which period a gram of chloroform was used. Five minutes after commencing its administration, the child suddenly became pale, the respirations shallow and the pulse small. Both respirations and pulse then ceased in spite of artificial respiration one minute after the cessation of using chloroform. 0.2 c.cm. of adrenalin (1-1000) was injected into the heart by puncture through the fourth intercostal space, close to the sternum. A needle of 3½ cm. was used. Almost instantly thereafter, the cardiac beats were restored and respiratory movements occurred.

According to the writer, there is little importance as to whether the injection is made into the myocardium or into the cardiac cavity. The essential thing is that one should avoid the danger zones and not use too strong a dose of adrenalin. Moreover, this method does not apply to hearts that have organic disease due to any previous infection, or hearts in which the failure has already been treated by cardiac stimulants.

C. F. Martin

Gastric Ulcer of Syphilitic Origin. *Cade: A., and Morenas (of Lyons). Arch. Mal. de l'App. Digestif. Vol. XII,* 1922.

Two cases are recorded by these observers, in which clinical observations were controlled by pathological anatomical evidence. There was a round ulcer of the stomach in one case, due to syphilitic lesions of the gastric vessels. This fact is of very special importance to the syndrome of gastric ulcer. It was observed in a man of ripe age suffering from abnormal gastric pains, coming on at indifferent times, and accompanied at times by hyperchlorhydria, and often with marked hæmatemesis. The anatomical examinations showed macroscopic vascular lesions, and, microscopically, that these were the origin of the ulcer. The character of these lesions opens up the question of anti-syphilitic treatment for these ulcer cases; it should be tried in the case of doubtful ulcers, and unsatisfactory results should alone determine the need of surgical interference. Gummatous ulcers of the stomach yield rapidly to treatment. C. F. Martin

On the Pathogenesis of Death from Scalds. *Cevaric, L., Pathologica,* 1921.

This subject, which is dealt with experimentally, was carried on by means of investigations on healthy white rats joined in pairs by lateral coeliostomy. One of each pair was scalded, while the other was left untouched.

The results of the investigations, which covered the examination of the central nervous system, spleen, kidneys, blood and hæmatopoietic organs generally, showed that some toxic substance is produced causing changes in the hæmatopoietic organs, central nervous system and the blood, a toxic substance which affected both the scalded and the non-scalded animals. In the nervous system marked chromatolytic changes were found as in other acute experimental poisonings. In some cases, pneumonic and renal inflammatory changes were found. The chief interest lies in the fact that the non-scalded animals were affected equally with the others. C. F. Martin

The Nature of Functional Disease. *McDougal, Wm. Am. J. Psychiatry,* Jan. 1922.

The writer opens his address with words of high praise of the attitude of Americans toward mental hygiene and their progress in the treatment and prevention of mental disorders, mentioning especially the establishment of psychopathic hospitals. The problem of the nature of functional disease is really that of structure versus function, or, in other words, that of mechanism versus vitalism. If the human organism is in every way comparable to a machine, disorder in the working of the machine could logically be attributed to some mechanical or chemical variation or defect in its parts.

The advances in biology, physics and chemistry in the nineteenth century tended strongly to establish this mechanistic view and profoundly affected medical science,—even mental medical science. Research was devoted to the study of brain structure, of defects which were assumed to underlie all mental disorders, and certain valuable results were achieved. But this led to the neglect of the psychological study of mental disorders and functions and, in consequence, the advance in the study and practice of psychiatry was disappointingly slow. Moreover, the search for a structural basis in psychoses led to a strict separation of these from the neuroses, which were considered merely functional and consequently despised and neglected, being regarded as mere products of the imagination. Dr. Pierre Janet in France and Dr. Morton Prince in America stand out preeminently as men who did not hold these views of the neuroses.

The general change of view, McDougal attributes to two causes; first, the large number of cases of psychosis and neurosis in the War; second, the work of the psychoanalysts. To the latter he gives the credit of having quickened the interest of the medical profession, and of the world at large, in psychological study, brought functional diseases out of their place of neglect, and helped to break down the artificial barrier between psychoses and neuroses. No longer can we regard the human organism as strictly comparable to a machine. The purpose for which it exists resides in itself and is self-regulating. Hence, functional disorder arises when environmental changes demand adjustments exceeding its powers of adjustment.

Purpose implies mind. Mental purposive operations go on on very different planes of consciousness. Functional disorders are commonly the expression of failure and disharmony of conflicting purposes which may be wholly or in part subconscious. It is, therefore, through mental influences that functional disorders are brought about. They are psychogenic. Bodily disorders may result from emotional disturbances, for instance, death from great emotional shock.

The writer then proceeds to discuss psychogenesis in the psychoses, and cites Kræpelin as taking a neutral standpoint, but leaning towards structural causation, while he has argued forcibly for the psychogenetic origin of dementia præcox. Mott, on the other hand, has described pathological changes in cases of dementia præcox, namely, mal-development of the sex glands and, in some of the brain neurones, an excess of lipoid granules, indicating hypofunction or diminished metabolism,—changes which Mott considers to be evidence of the structural origin of the disease. To this McDougal replies with the argument that, if structural changes can result from an excess of function, (as for instance, those due to excessive and prolonged activity occasioned by strong instinctive tendencies such as rage and fear,) it is reasonable to assume that changes such as excess of lipoid granules may result from diminished oxidation and metabolism, brought about by checking and depression of instinctive activities, as may happen in dementia præcox through unfortunate mental influences. Here must be assumed a congenital predisposition which renders the patient peculiarly liable to such depression of instinctive emotional tendencies. The demonstration of organic changes in a case of mental disease of some standing does not, the author contends, prove the disease to be of organic origin.

In many cases of exophthalmic goitre, functional disturbances seem to precede organic changes, notably those arising from prolonged or repeated excitation of the fear instinct. A vicious circle is established in which the emotion excites the bodily and chemical reactions of fear, and these in turn render the organism more responsive to impressions exciting fear. Here we have an organic disorder resulting from mental impressions. Why not then look for a psychogenetic origin in such conditions as dementia præcox, manic, depressive and epileptic insanities? In these latter fear may play a larger part than is commonly supposed.

The writer maintains that psychogenetic factors play an essential part in the onset of some mental diseases and that the recognition of this is a distinct step in advance. Biology and psychology should not be bound down by concepts applied to the physical sciences, that is by mechanistic concepts. Purposive activity should be the fundamental working conception.

In conclusion he mentions three possibilities with regard to functional disease:

(1) Diseases which, though involving structural and chemical abnormalities, are of functional origin.

(2) Diseases which are of functional origin and essence, involving no strictly pathological change, but only a disturbance of the quantitative balance of functions.

(3) Mental diseases which are of the mind only and not at all of the body.

The first and second are not only possible but abundantly realized in numerous cases. As to the third,—we must keep an open mind.

A. G. Morphy

On the Duodenal Reflux into the Stomach in the Course of Gastric Digestion. *Bolton, C. and Goodhart, G. W. The Lancet,* Feb. 11th, 1922.

Boldyref has shown that if one introduces mineral or organic acids of known concentration into the stomach of a dog, the acid diminishes progressively because the liquid is neutralised in the stomach chiefly by the pancreatic juice. This occurs through anti-peristaltic movements because of the irritation of the intestine. It appears to be an auto-regulatory mechanism.

Researches on man have led to the same conclusions, though one does not know exactly when or how the contents of the stomach in the digestive period are neutralised by this reflux of pancreatic juice. The authors have employed the gruel test breakfast and have made gastric analysis every quarter of an hour. They find that the duodenal reflux is constantly produced, although at varying periods during digestion, and that it is a very important element in the normal stomach and explains variations of the acid curves.

Free hydrochloric acid, if found, usually rises to .2 per cent. then falls abruptly, corresponding to the neutralisation by the alkaline pancreatic juice. Sometimes it rises slowly, due to a cessation of the duodenal reflux from spasm of the pylorus; or again, it may rise continually during several hours, which would seem to imply organic obstruction or spasm of the pylorus. On this evidence, then, the amount of free hydrochloric acid is not a measure of gastric secretion, but rather is the result of two processes—secretion and neutralisation.

The curve of the combined acids varies according to the three types. First, it rises rapidly and continues to rise while the free hydrochloric acid diminishes because the latter is neutralised by the reflux of duodenal juice. In the second type, the curve falls because of the delayed rise of the free hydrochloric acid; and, in the third, type it remains fairly low.

The curve of the total chlorides naturally represents the sum of the two preceding secretions. It is always higher than that of the combined chlorides, and it is this curve which most of all enables one to estimate the activity of gastric secretion.

The writer's conclusions are that the absence or diminution of free hydrochloric acid is of little significance in itself, as the total chlorides may be normal. It does show, however, a very free regurgitation from the duodenum. The type of curve which continually rises for several hours does not necessarily imply hypersecretion, but rather delay in or insufficiency of the pyloric relaxation. The estimation, then, of these various curves permits an opinion as to how and at what hour regurgitations from the duodenum occur.

C. F. Martin

On the Hysterical Nature of Severe Vomiting in Pregnancy. *Hurst, A. F. The Lancet,* March 18th, 1922.

The writer appears to disagree with those who hold to the theory that hyperemesis of pregnancy is due to increase in the urinary ammonia. W. Williams divides hyperemesis of pregnancy into three groups: (1) Reflex (secondary to some organic disease); (2) Nervous vomiting; (3) Toxic vomiting.

The different diagnoses between these two last, as well as the prognoses, are determined by the amount of ammonia found. Hurst reports the case of a woman who vomited constantly both after her meals and in the intervals between; the tongue was dry, the pulse rapid, and the urine contained 28 per cent. of ammonia and a large amount of diacetic acid. Psychotherapy sufficed to cure the patient and to relieve all the pathological phenomena. The patient gained about 18 lbs. in four weeks. During a later pregnancy, vomiting again occurred, but disappeared in the same way.

Hurst believes that the excess of ammonia and the diaceturia are caused by dehydration and not from intoxication; and hence, he does not believe that these changes are of any value to distinguish the two varieties of hyperemesis. Intractable cases are always due to nervous origin, or rather, hysterical origin, being caused by suggestion and curable by psychotherapy.

C. F. Martin

The Effects of Alcohol upon Digestion in the Stomach. *Haneborg, A. C. Acta Med. Scand.*, 1921.

The writer finds that the increased secretion of gastric juice following upon small doses of alcohol was not obtained until after the alcohol had been absorbed. It seemed most likely that this increased secretion was due to the generally exciting action of the alcohol on the nervous system. Alcohol was not found to have any effect upon the proteolytic action of gastric juice *in vitro* when the concentration was less than 10 per cent. In higher concentrations, it either reduced the proteolytic action, or prevented it altogether. This may have been due to the precipitation of pepsin by the alcohol. Comparatively large doses of alcohol after a meal constantly promoted secretion, whereas the same amount on an empty stomach disturbed the digestion to a considerable extent.

Under pathological conditions, Haneborg shows that chronic gastritis does not prevent absorption of alcohol by the stomach. The effect of alcohol on patients suffering from hyperacidity or from gastric ulcer was to increase the acidity, the pyrosis and the pain. In cancer, however, the alcohol seemed to relieve the various discomforts, though it did not seem to affect the secretion of gastric juice. The digestion was promoted by small quantities of alcohol in achylia and chronic gastritis, and in several cases alcohol yielded free hydrochloric acid in a gastric juice where it had previously been lacking. Though small doses of alcohol taken with food promoted digestion in healthy persons, the effect of this small dose under pathological conditions seemed to be largely dependent on individual peculiarities. This was probably due to the fact that alcohol acts through the nervous system, whose receptivity and reactive capacity vary very considerably.

In the course of his investigations, Haneborg has made a very interesting discovery, *viz*, that in healthy persons over the age of fifty, free hydrochloric acid is deficient with a very remarkable frequency. In more than 50 per cent. of persons over that age, the acid was either absent or considerably reduced. In such persons there are no digestive troubles so long as the food is properly composed and prepared, but they are susceptible to attacks of indigestion, which, in certain cases, could be relieved by alcohol provided it does not constitute more than 10 per cent. of the total contents of the stomach. C. F. Martin

Relation of Faulty Cultures to Diphtheria Mortality.

O'Keefe, Edward Scott., Boston M. and S. J., May 4th, 1922.

Among the causes interfering with a favourable outcome in diphtheria, two are of special significance. One is the failure of the physician to recognize the condition clinically, and the other is his reliance on a negative laboratory finding. A large number of primary cultures as ordinarily taken in true cases of the disease are negative. Swabbing the surface of the lesion is not sufficient. The organisms can be consistently found only within or under the membrane itself. This latter requires a moderately forcible rubbing of the infected area with a strong swab stick.

A. H. MacCordick

Erysipelas, Streptococcal Septicæmia.

Erian; A., Practitioner; London, May 1922.

The writer has studied over 500 cases of erysipelas. The disease may become epidemic like typhoid, but remains longer in the district when once established. Erysipelas of the face may spread over the body, may cause cellulitis and even septicæmia. There may be inflammation of the orbit with exophthalmos, pain in the eyeball, and squint. These eye symptoms readily subside, however, under hot fomentations, and seldom cause permanent disability. Streptococcus septicæmia may arise from erysipelas, the number relatively increasing as the epidemic continues. The prognosis in septicæmia following erysipelas is bad. The early injection of anti-streptococcus serum is of great value. 40 to 50 c.c. may be given as soon as a diagnosis is made and repeated daily until temperature subsides. A. H. MacCordick

On Quinidine in Auricular Fibrillation.

Hart, Stuart T. Association of American Physicians, Annual Meeting, 1922.

Seventeen cases, chosen at random, were treated, of which fifteen had genuine fibrillation. The drug was administered in two preliminary doses of 0.2 gm. each, and one day was allowed to elapse as a safeguard against susceptibility. In favourable cases, a dose of 0.4 gm. was given three times a day, and the drug discontinued when sinus rhythm had been re-established. The results were most satisfactory, and the drug successfully produced sinus rhythm usually within two days from the onset of the therapy.

The writer saw no dangerous sequelæ from the administration of the drug. He advocates the use of quinidine only in these cases where digitalis has not been used at all, say, within the previous few weeks, on the ground that quinidine and digitalis are pharmacologically antagonistic. Quinidine slows the auricle and increases the rate of the ventricle, while digitalis has the reverse effect on auricle and ventricle. C. F. Martin

On Various Forms of Endocarditis.

Libman, E. Association of American Physicians, Annual Meeting, 1922.

The writer classifies types of endocarditis as rheumatic, syphilitic, acute bacterial, sub-acute bacterial and indeterminate. In the rheumatic endocarditis, the specific lesion is the Aschoff body, a perivascular lesion. The bacterial cases are so called because they are due to known bacteria. In the case of the acute variety, the chief organisms are hæmolytic streptococci, pneumococci, staphylococci, gonococci, etc. Of the sub-acute cases, more than 95 per cent. are due to *streptococcus viridans* (anhæmolytic). The indeterminate cases are, for the most part, due to influenza bacillus.

In all these cases, the portal of infection is mainly due, in the acute cases, to a septic purulent focus. In the sub-acute cases, either a focal infection or intestinal trouble initiates the disease. Libman is of the opinion that the acute cases should all be named according to the etiological agent that is found. Sub-acute cases, however, should be called after the causative factor only until such time as a better scheme of grouping can be developed. C. F. Martin

Experiments on the Variability in Susceptibility to Poison Ivy. *Brown, E. D. Arch. of Derm. and Syph.*, June 1922.

The writer considers that different degrees of susceptibility exist, varying even in the same person. But, however different in degree, there seems no real ground for saying that complete immunity exists. It may take anywhere from five hours to eight days for symptoms to appear.

The spread of the eruption does not depend on its conveyance by the hands.

He has never been able to find any involvement of the mucous membranes. One patient even chewed the leaves, and yet the mouth was unaffected. But he has seen cases in which eating of the leaf, as an antidote, gave rise to marked eruption around the anus. And this in his opinion militates against the possibility of desensitization, as the principle is evidently excreted without any absorption by the mucous membranes.

In his own experience and that of certain other observers, susceptibility was increased by successive poisonings. H. E. MacDermott

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Erythema Nodosum.—Gueissaz (*Rev. med. Suisse rom.*, October and November, 1921) discusses the following theories as to the etiology of erythema nodosum, which was first described by Willan, (1) The oldest view, that it is a rheumatic manifestation, was maintained by Barthez (1802), Schönlein (1829), and Bouillaud (1840), this theory being founded on the presence of pains in the joints which are almost constant. (2) Writers such as Cruveilhier, Chomel, Tardieu, Grisolle, Trousseau and Germain Sée contest its rheumatic origin, and maintain that it is an independent infectious disease. (3) During the last fifteen years almost all writers have been inclined to regard erythema nodosum as closely connected with tuberculosis. Thus Voyer in 1920, out of 47 cases of erythema nodosum, found in 46 either a tuberculous heredity or stigmata of tuberculosis in the patient. According to Gueissaz erythema nodosum is not a frequent disease. At the Lausanne Policlinic only one case was found among 1,000 cases of all kinds. The disease is most frequent in the north, especially in Scandinavia. At Hamburg the average number of cases is also 1 in 1,000 (Hegler). According to Schulthess at the Zurich Policlinic, out of 80,000 patients, there were 113 of erythema nodosum, or 1.4 per 1,000. Gueissaz found that country folk were almost as frequently attacked as townspeople. Three times as many girls as boys were attacked in his statistics, as in Syme's (vide *British Medical Journal*, April 25th, 1914). In six of Gueissaz's cases several members of the family were attacked. Usually the weaker children were affected, but after the age of 15 the disease was equally frequent among those with a good constitution. Gueissaz's conclusions are as follows: (1) There is a primary specific erythema nodosum which possesses all the characteristic features of an acute exanthem. The proofs of its autonomy are as follows: (*a*) The disease attacks females more frequently than males; it occurs at every age, but is commonest between 5 and 20; it is a definitely seasonal disorder, being most frequent in spring; it attacks all classes of society both in the country and in the town. (*b*) Erythema nodosum is an undoubtedly contagious disease, the pathogenic agent of which is still unknown, but has sometimes its portal of entry in the tonsils. It may occur in epidemic form. (*c*) Erythema nodosum conveys immunity, instances of a second attack being extremely rare; it may develop in persons free from any other infection, but it attacks quite as frequently the tuberculous or rheumatic. (2) Under certain conditions tuberculosis, syphilis, malaria or leprosy may give rise to an eruption resembling erythema nodosum. In tuberculosis in particular a relapsing erythema may occur which at its onset presents the features of erythema nodosum, and in its repeated attacks resembles the erythema induratum of Bazin.—*Brit. Med. Jour.*, January 1922.

News Items

NOVA SCOTIA

The Health Centres clinical activities and some of the field activities of the Massachusetts-Halifax Health Commission, as summarized by the Chief Nurse for July show a total of seven hundred and fifty-six medical and nursing consultations. Of these, one hundred and ninety-five were in the child welfare and prenatal service; one hundred and six in the pre-school age dental service; one hundred and fifty-five in the nutrition classes: four in the posture clinic: sixty-six in the ear, nose, and throat services; sixty-seven in the three tuberculosis clinic services, nineteen of them being in the clinic conducted in the Halifax Dispensary; nine in the skin clinic: sixty in the pre-school age clinic; and ninety-four in the venereal disease clinic.

In summarizing the field work of the public health nurses from the Health Centres of Halifax and Dartmouth, this report sets forth that a total of thirty-four hundred and fifty-seven visits were made in a total of twenty-three hundred and ninety-two homes, in these communities and adjacent thereto. In addition, the visiting housekeeper made one hundred and twenty-seven instructional visits into thirty-six homes where nutrition problems were paramount.

The total number of babies under two years of age receiving medical and nursing guidance total eight hundred and eighty-four. Eighty-eight prenatal visits were made by public health nurses during July.

No deaths occurred among babies with whom the public health nurses are working, and the total death rate among babies for this month is one of the lowest recorded.

Among the multifarious activities of the Massachusetts-Halifax Health Commission, which is conducting a most extensive public health experiment in Halifax and Dartmouth, Nova Scotia (population about 70,000.) its tuberculosis services are quite worthy of special note. During the year six clinics were held by the examiner, Dr. T. M. Sieniewicz, and his associates, two at Health Centre No. 1, two at the Halifax Dispensary, one at Health Centre No. 2, Dartmouth, and one at Tufts Cove, an outlying needy section of Dartmouth. There were 233 separate clinics, in which 422 new cases were examined. Adding these to the 322 cases already on the records, makes a total of 744 under surveillance. A Public Health nurse takes notes at every tuberculosis clinic and carries out in the home the special advice or treatment ordered by the examiner. All home contacts are given a complete examination for tuberculosis. When nutrition problems are paramount, a visiting housekeeper, as well as a public health nurse, makes periodic visits to the home, and the under-nourished children are enrolled in one of the nutrition classes. During the year just completed, 4,261 visits were made by these most essential coadjutors.

During the summer of 1921, the Anti-Tuberculosis League undertook the support of 25 under-nourished children in an open air camp on the the grounds of Health Centre No. 1. Those admitted included for the most part, those children known to have been exposed to open tuberculosis. The camp was a complete success.

The services of the Tuberculosis Examiner as a consultant are at the disposal of the city practitioners. This consulting service is operated on a basis very much like that of Bartlett's, Framingham, and is bringing good results. 148 persons were examined in consultation during the year. The Tuberculosis Examiner delivered a series of lectures in the course of Public Health Nursing, and gave another series of 60 lectures to the third and fourth year medical students of Dalhousie University. His services as a lecturer are available, free, to any club or society. Two lectures were given last year to the students of the normal class of Mount St. Vincent Academy. In June (1922), he delivered an address at the Public Health Congress, St. John. New Brunswick. In April, he was loaned to that city to assist in their case-finding campaign.

It will be seen from the above that in one way or other, a large section of the city is being influenced by the preventive and curative work in tuberculosis undertaken by the Massachusetts Halifax Health Commission; and it is safe to prophesy that the close of their period of existence will show a marked decrease not only in the mortality from tuberculosis but from all preventable diseases.

ONTARIO

At Convocation Hall on June 9th, one hundred and thirty candidates were given the degree of M.B. The following scholarships, fellowships, and medals were awarded:—Faculty of Medicine—The Starr Gold Medal, F. G. Banting; the Starr Silver Medals, F. F. Tisdall, H. B. Maitland; the George Brown Memorial Scholarship in Medical Science, R. H. McDonald; the George Armstrong Peters Scholarship, F. G. Banting; the James H. Richardson Fellowship in Anatomy, W. C. M. Scott: the Charles Mickle Fellowship, H. Cushing; the Ellen Mickle Fellowship, J. E. Bates.

District No. 9 of the Ontario Medical Association, comprising the Districts of Muskoka, Parry Sound, Nipissing, Temiskaming, Sudbury and Algoma, of which Dr. Edgar Brandon of North Bay is Counsellor, held its third annual meeting at Sudbury on Wednesday, August 2nd. After luncheon, at which upwards of fifty sat down as guests of the Sudbury District Medical Society, Dr. R. H. Arthur, Mayor of Sudbury, in a few well-chosen words, welcomed the visitors. At 2.00 p.m., the party set out by motor for Ramsay Lake, a few miles distant from the town, arriving at the picturesque summer home of Dr. W. H. Howey shortly before three o'clock. Here, the following program was presented:—Treatment of the Commoner Dermatoses, by Dr. G. W. Ross, Toronto; Albuminuria of Pregnancy, by Dr. G. W. Smith, North Bay; The Surgery of the Pelvic Organs, by Dr. Fred. W. Marlow, Toronto; The Red Cross and Medical Profession, by Dr. Fred W. Routley, Toronto; Abdominal Emergencies in Children, by Dr. R. I. Harris, Toronto. At 6.00 p.m. the meeting adjourned to partake of a picnic supper which the ladies had kindly provided. A short cruise about the lake followed. The meeting reconvened at the Nickle Range Hotel in Sudbury, at 8.30 p.m., where addresses were delivered by Dr. E. R. Secord, President of the Ontario Medical Association, Dr. Malcolm MacEachern of Vancouver, and Dr. T. C. Routley, Secretary of the Ontario Medical Association. From point of view of attendance, program, weather, hospitality and good-fellowship, the meeting was indeed a success.

The degree of M.D.C.M. was granted to forty-seven graduates of Queen's University Medical School at the convocation in June of this year. The degree of M.B. is no longer given from this old and well established faculty. The council results show that twenty-seven candidates were successful in passing the examinations of the Ontario Council, eight passed the Dominion Council, and two, both the Ontario and Dominion. The prize list for the year was as follows:—The New York Alumni Association Scholarship ($50.00), for the highest marks in Embryology and Histology of the second year, Quartus Bliss, Kingston(with honour of Faculty Scholarship). A Faculty Scholarship of $50.00 awarded to the student making the highest number of marks on the examinations of the second year, C. Everard Lyght, Hamilton. The Dean Fowler Scholarship ($50.00) for the highest marks on the examinations of the third year, Chas. S. Appelbe, B.A., Parry Sound. A Faculty Scholarship ($50.00) for the highest marks on the examinations of the fourth year, John H. Orr, Kingston. Medal in Medicine, John H. Pilkey, Wexford. Medal in Surgery, C. Merlin Eynon, Ottawa.

The Lambton County Medical Society met at Petrolia on July 12th, in an open air meeting at the Town Hospital. Dr. Gwyn of Toronto addressed the meeting on "Heart disease; its recognition and treatment by the general practitioner."

Dr. Ernest Cullen of Detroit, a graduate of 1903, Toronto, and one of our most promising Canadian surgeons, died suddenly in July, from a gastric hæmorrhage.

The following resolution was passed at the Winnipeg meeting of the Canadian Medical Association:—Moved by Dr. Primrose, seconded by Dr. Marlow, and resolved: "That in order to avoid delays and facilitate prompt publication of material from the various provinces, it be recommended that all such material be sent to each respective Provincal Secretary of the Editorial Board of the Journal, and through him to the Editor-in-Chief."

BRITISH COLUMBIA

Dr. A. W. Kenning is reported convalescent, after his recent illness.

Dr. Douglas W. Graham, formerly of Swift Current, is now engaged in practice in Victoria.

Dr. W. J. C. Tomalin has returned to Victoria after an enforced holiday through illness.

Dr. Irene Barstow-Hudson, formerly of London, England, has commenced practice in Victoria.

Dr. Tillman A. Briggs is now engaged in practice at Courtenay with Dr. H. P. Millard, who is the pioneer medical man in that district.

Dr. David Donald has recently been appointed to the post of School Medical Officer, for Victoria. Colonel Donald was well known in the Medical Corps with the Canadian over-seas forces.

Dr. H. Rundle Nelson, who has for several years been in charge of the Dominion Quarantine Station at William Head, is now in Victoria, and has received the appointment of Radiologist at St. Joseph's Hospital.

Dr. J. F. Brodie, of Vancouver, and Dr. L. K. Poyntz, Victoria, have been appointed to the Executive of the B. C. Medical Association by the Vancouver Medical Society, and the Victoria Medical Society respectively.

The Hon. Dr. Beland, Minister of Health, and Dr. W. C. Arnold, Director of Medical Services of the Department of Soldiers' Civil Re-Establishment, who were in Vancouver on an inspection trip, were entertained at luncheon by the Vancouver Medical Association, on the 3rd of August.

The annual meeting of the Okanagan Medical Society (District No. 4), was held in July, when the following officers were appointed:—President, Dr. Osborne Morris, Vernon; Vice-President, Dr. J. S. Burris, Kamloops; Secretary-Treasurer, Dr. J. W. Arbuckle, Vernon; Representative to Executive of the B. C. Medical Association, Dr. H. H. Murphy, Kamloops; Delegates to August Meeting of the B. C. Medical Association, Dr. F. W. Andrew, Summerland; Dr. H. McGregor, Penticton.

The Victoria Medical Society has always had a keen interest in matters affecting the profession, not only locally, but also those of the Dominion and the provinces. The entire active profession in Victoria and district has subscribed to the B. C. Medical Association. The Victoria Society is to be congratulated on the opening of a new medical library. The new rooms provide not only a library reading room, but a large meeting room as well. Dr. H. J. Wasson, President; Dr. H. M. Robertson, Vice-President; Dr. M. W. Thomas, Secretary-Treasurer, form the Executive of the Victoria Medical Society. The thanks of the Society is due to the energetic Library Committee, of which the following are members:—Dr. Forrest Leeder (Chairman), Drs. Walter Bapty, W. J. Barrett, E. W. Boak, Geo. Hall, A. L. Jones, A. E. McMicking, T. MacPherson, A. W. Kenning, G. C. Kenning, M. J. Keys, H. E. Ridewood.

The Vancouver Medical Association has held several special meetings during the summer months, when the members were addressed by distinguished members of the profession from outside points. On June 21st, Dr. W. E. Gallie, of the Sick Children's Hospital, Toronto, gave an interesting lecture on "Living Sutures," which was illustrated by lantern slides. In July, Dr. Alexander McPhedran of Toronto, held a Clinic at the Vancouver General Hospital, and also gave an address on "The Importance of Physical Conditions in Internal Medicine." On the 21st of July, Dr. William Engelbach, Professor of Medicine at St. Louis University, delivered an address on "The Diagnosis of Diseases of the Ductless Glands," and was followed by Dr. Robt. H. Millwee, of Dallas, Texas, who spoke on "Deep Roentgen Therapy." On August 9th, Dr. Louis Hirschman, Professor of Proctology, Detroit, gave a clinic at the Vancouver General Hospital to the Members of the Association.

GENERAL

Under the title of The Post Graduate School of Neurology and Psychiatry of the District of Columbia, a school for the graduate teaching of diseases of the nervous system has been recently organized in Washington, and will open formally in October. Dr. Wm. A. White, Superintendent of St. Elizabeth's Hospital, is President of the institution; Dr. Tom A. Williams, Vice President; Dr. D. Percy Hickling, Dean of the faculty; and Dr. Daniel D. V. Stuart, jr., Secretary-Treasurer. Two courses of study, elementary and advanced, of six weeks each are to be offered; together with an elective course in special subjects.

The Winnipeg Medical Society offers for competition among the medical men registered in Manitoba, who graduated not earlier than 1917, a prize of $200 to be awarded for the best essay on any subject related to the science or art of medicine. The essay must be in the hands of the Secretary of the Society not later than December 31st, 1922. The Society reserves the right to withhold the prize unless, in the opinion of the judges appointed by the Executive Council of the Society, the essays are of sufficient merit. Address communications to the Secretary, The Winnipeg Medical Society, Medical College, Winnipeg.

The Third Annual Convention of the Canadian Radiological Society was held in Winnipeg in conjunction with that of the Dominion Medical Association, June 20th–24th, 1922. The scientific session lasted for three days and included a series of extremely interesting communications. We had the honour to have present with us and contributing to the program, Drs. Lewis Gregory Cole, Russell D. Carman, B. H. Orndorf, R. H. Stevens, F. S. Bissell, and C. J. Sutherland. The Officers elected for the coming year are:—President, L. J. Carter, Brandon; First Vice-President, Dr. C. W. Prowd, Vancouver; Second Vice-President, Dr. J. C. McMillan, Winnipeg; Third Vice-President, Dr. L. T. Pariseau, Montreal; Secretary-Treasurer, Dr. L. K. Poyntz, Victoria. The Executive Committee is composed of Dr. G. E. Richards, Toronto; Dr. A. E. Walkey, Hamilton; Dr. L. K. Poyntz, Victoria.

The rules and regulations governing the Canadian Register of Technicians established in 1921, were adopted, and Dr. L. K. Poyntz of Victoria, was appointed Registrar and Examiner.

Dublin University on the 4th instant, conferred on Prof. Geo. E. Armstrong, M.D., LL.D., the honorary degree of *Magister in Chirurgia*. The Earl of Middleton and the Lord Chief Justice of Ireland were also recipients of honorary degrees at the same time. It was during the eventful days when the Four Courts were stormed by the Nationals and taken, so that both during the ceremony, and throughout the whole period of the evening banquet, the booming of cannon was interspersed with the sharp crack of almost continuous rifle fire. Prof. Armstrong was strongly advised by friends in England not to go to Dublin during this week, but, as he had promised his friends, he was not to be dissuaded. On attempting to drive on some roads outside the city, on the following day, he was met at short intervals by barriers of fallen trees, telegraph poles and broken agricultural implements of all sorts manned by soldiers, national or irregular, and finally had to turn back. He returned to Montreal on the 16th August.

Obituary

DR. ERNEST KEYES CULLEN

The news of the sudden death, from hæmorrhage of the stomach, of Dr. E. K. Cullen in Detroit on July 5th, after only twenty-four hours' illness, came as a sudden shock to the medical profession throughout Ontario.

Dr. Cullen was a son of the late Rev. Thomas Cullen, a minister of the Methodist Church, well known both in London and in Toronto. He studied medicine in the faculty of medicine, Toronto University and, after graduation in 1899, he acted as house surgeon in Toronto General Hospital and then went to Johns Hopkins Hospital, Baltimore, where he spent eight years in post-graduate work, specializing chiefly in abdominal surgery and gynæcology. In 1912 he settled in Detroit, and soon became associated with the teaching staff of the Detroit Medical College. At the time of his death he was Professor of Gynæcology in it, and was head of the gynæcological department of both Harper and St. Mary's Hospitals.

Dr. Cullen has written many articles for publication, and has frequently addressed medical societies on both sides of the line. In February last he gave a paper in Galt before the South Waterloo Medical Society on "Pneumo-Peritoneum."

Dr. Cullen is survived by a widow and a seven months' old daughter. Dr. Thomas S. Cullen of Baltimore, is his only brother. He was buried beside his parents in the family plot of ground in London, Ont.

Those of us who knew him best will remember him best not only for his surgical skill, but for his kind and genial disposition.

At the Victoria General Hospital in Halifax, Dr. Frederick William Kelly of Bridgewater, died after a comparatively short illness. A graduate of Dalhousie University and also of Bowdoin College, Dr. Kelly first took up his practice of medicine in Chester, and after some years moved to Bridgewater, where he spent the last twenty years of his life in a somewhat arduous practice. Untempted by the prizes which a large city could offer a man of his ability, he pursued his quiet way faithful to every trust reposed in him. His death is deeply regretted, not only by his immediate patients, but also by all in Bridgewater and in the neighbouring country. He is survived by two sons, Mr. Rex Kelly and Dr. Bruce Kelly, both residents of Bridgewater.

ROBIE DUGWELL BENTLEY

The citizens of Truro, and the Medical Profession not only in Nova Scotia were shocked to learn that Dr. R. D. Bentley of Truro was shot on the Main Street of that town within a few yards of his home by an Assyrian whom he had been treating. Dr. Fulton who happened to be on the street near by, at once attended the prostrate doctor, who exclaimed before losing consciousness "He shot me; get that man, he's crazy." The murderer ran across the street to his shoe store, locked himself in, and shot himself. The doctor died within half an hour and the murderer three or four hours later in the local hospital.

Dr. Bentley graduated from Dalhousie University in 1897, and practised for several years in Wallace, Cumberland Co., Nova Scotia, where he had a large practice. In 1915 he settled in Truro. Dr. Bentley's worth as a physician was of a high order. He was a careful and accurate diagnostician, and gained the confidence of all those with whom he came in contact.

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Book Reviews

Surgical and Mechanical Treatment of Peripheral Nerves. By Byron Stookey, A.M., M.D., Associate in Neurology, Columbia University: Assistant Surgeon, New York Neurological Institute; Assistant Professor of Neuro-Surgery, New York Post Graduate Medical School and Hospital. With a chapter on "Nerve Degeneration and Regeneration," by G. Carl Huber, M.D., Professor of Anatomy, University of Michigan. Large octavo, 475 pages, with 217 illustrations—eight in color—and 20 charts. Philadelphia and London, W. B. Saunders Company, 1922. Sole Canadian Agents, The J. F. Hartz Co., Ltd., Toronto. Price $10 50.

This volume may at once be described as a very excellent, complete and painstaking discussion of the subject of peripheral nerve injuries, and their surgical treatment. Of special interest are the special chapters devoted to methods of nerve repair, direct nerve implantation and direct muscular implantation, tubulization, nerve liberation, the technic of nerve suture, and the indications for operation and the time to operate, with a consideration of the causes of failure. The remainder of the work is occupied with a discussion of the injuries of individual nerves and the best means of combating these, with final chapters on nerve tumours, causalgia and amputation neuroma. The book is well written, well printed and exceptionally well illustrated, and each chapter has a very complete list of references attached. The author and publisher are both to be congratulated on their product, and the volume may well be described as of that type of monograph which really plays a useful part in the elucidation of surgical problems. E. R. S.

Artificial Limbs and Amputation Stumps. A Practical Handbook, by E. Muirhead Little, F.R.C.S., Eng., Consulting Surgeon to the Royal National Orthopædic Hospital. Pages viii and 319, with 267 illustrations. Demy 8vo. Price 18s. net. London, H. K. Lewis & Co., Ltd., 1922.

In this handbook the author records the conclusions which have been reached as the result of six years' experience (during the war) in the treatment of amputation stumps at the Royal National Orthopædic and in various Red Cross Hospitals, as well as the review of some 25,000 amputation cases at Roehampton.

The requirements which are characteristic of a good stump are discussed, as well as the conditions which prevent or delay the fitting of a satisfactory prosthesis.

Various forms of prostheses for both the arm and the leg are described, special attention being paid to the "British Official" forms.

It would seem that consideration of these various data should be of extreme interest to the practical surgeon, and it is to be hoped that the experiences gained during the war will tend towards better fitting artificial limbs. Previous to that time, in civilian practice at least, one sometimes thought that it was the part of wisdom to so fashion the stump that it would adapt itself to the standard type of limb available, rather than to take a chance on getting a limb that would suit the individual stump. E. R. S.

An Essay on the Physiology of Mind. By Francis X. Dercum, M.D., Ph.D., Professor of Nervous and Mental Diseases in the Jefferson Medical College, Philadelphia. 12mo, of 150 pages. Philadelphia and London, W. B. Saunders Company, 1922 Cloth, $2 00 net J. F. Hartz Co., Toronto

Dercum has given us a most interesting essay, and written it in his usual charming manner, so that one can read a clever summary of the development of the mind from the amœba to man, and feel a real enjoyment in following his able reasoning. He is a firm believer in the two possible laws of the neurone theory, namely, that, in certain conditions, the nerve cell is in a condition of fixation, and, under other conditions, in a state of freedom. Accustomed paths of activity lead to fixation, while the highest cortical neurones are characteristically free. So the systematized delusions are a symptom of the lower or fixation state. An interesting but perhaps ideal view of the emotions places their origin in the ever increasing field of the action of the hormones and toxines of the body. Dercum is here giving voice to his views that the mechanism of mind is definitely physical, and he refuses to discuss the Psyche, while he equally shows his well known antipathy to Freudian views by his bare mention of the latter's dream theories. It is very refreshing to read the views of a physicist, after being saturated by books on sexual determination. G. W. H.

Practical Infant Feeding. By Lewis Webb Hill, M.D. Published by W. B. Saunders & Company, Philadelphia, U.S.A. J. F. Hartz Co., Ltd., Toronto. Octavo, 483 pages, illustrated. Price $5 50.

This book presents to the medical profession, especially the pediatrist, a well written and edited work. The author states in his preface "that the book is practical without being superficial, and scientific without being tiresome." The author throughout has adhered fairly well to his original resolution, although it is probably best suited for the specialist.

The arrangement is good, commencing with the chapter on Physiology and Pathology of digestion, maternal feeding, history of artificial feeding with a detailed discussion of its various phases, and finally ending with clear and comprehensive analyses of the various deficiency diseases. The only regettable feature is the author's recommendation of top milk and whey mixtures which, outside of Boston, have long been relegated to the past. In spite of this, however, the book is most commendable in all other features, and should find its place in the library of all pediatricians. A. B.

Practical Psycho-Analysis. By H. Somerville, B.Sc., F.C.S., L.R.C.P., M.R.C.S. 142 pages. Published by Bailliere, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, Eng., 1922. Price $2 50 J. F. Hartz & Co., Toronto, sole agents for Canada.

This book on Psychological methods, is one of the most satisfactory compends of Freud's theories that has been published. To the physician who desires to attain a knowledge of the practical side of the sexual basis of the mind, the plan followed here and the clearness of the arrangement and text are both admirable. The writer is an intense Freudian, and not so half-hearted an enthusiast as many of the more recent writers are. It is necessary for every physician to understand these theories, even if he personally decides that they are not tenable; and, in any case, they form a good introduction to the subconscious causes of mental disturbance, which the careful reader will begin to realize, while actually allocating the types due to sexual causes to a small and minor group. G. W. H.

Intensive Treatment of Syphillis and Locomotor Ataxia. By Aachen Methods (with notes on Salvarsan). By Reginald Hayes, M.R.C.S. Fourth edition, revised 99 pages, 4 plates. Price 4s. 6d. Published by Bailliere, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, England, 1922.

The fourth edition of this book is very interesting to the general practitioner, as he so frequently has many cases of specific disease under his care. Mercury is the

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Issued in 1917 and Maturing 1st December, 1922

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The bonds of the maturing issue which are not converted under this proposal will be paid off in cash on the 1st December, 1922.

W. S. FIELDING,
Minister of Finance.

Dated at Ottawa, 8th August, 1922.

backbone of the Aachen method, and it is given very unsparingly in courses of 100 to 200 rubbings; and, in preference to arsenic, in syphilis of the nervous system, diarsenol is given in short courses, and the sulphur waters are used as a very important factor of the cure, which makes one wonder why syphilis is not more popularly treated at some of our Canadian sulphur springs. The book should be at the side of every physician, as it repays reading. G. W. H.

Obstetrical Nursing. A Text-book on the Care of the Expectant Mother, the Woman in Labour, the Young Mother and her Baby. By Carolyn Conant van Blarcom, R.N., formerly Assistant Superintendent and Instructor in Obstetrical Nursing and the Care of Infants and Children at the Johns Hopkins Hospital Training School for Nurses. 200 illustrations and 8 charts. New York, the Macmillan Company, 1922.

From a pupil of Miss Nutting of the Johns Hopkins Training School for Nurses, and from one who had been brought on along the highly specialized lines developed in this school by Miss Hampton (Mrs. Hunter Robb), one would only expect the best. It is not too much to say that Miss Van Blarcom has set a standard for those who in the future may wish to put forth a work on obstetrical nursing.

Miss Van Blarcom's experience in nursing allows her to go far afield, and a text book has been produced that should be accepted as an authoritative work of reference. The insertion of Care Melchers's "The Caress," and the quotations of Florence Nightingale and Bishop Brent, is an artistic touch too often omitted in the "dry as dust" volumes put into the unwilling hands of students to-day. Excellently and simply divided into seven parts, the easy English and the splendid reproductions take the interested reader forward, through chapters on anatomy and physiology—Development of the Baby—The Expectant Mother—The Birth of the Baby—The Young Mother—The Maternity Patient in the Community and the Care of the Baby. Excessive technicality is avoided; numerous plates are used to explain anatomical intricacies, and any one interested in this department of nursing will find Miss Van Blarcom's text book amply sufficient for her needs.

The pleasing part perhaps of the whole volume, is the latitude and longitude of her observations. It is hopeful, indeed, to see the insertion of ancient obstetrical prints in a volume intended for modern nurses; the number of clinical pictures take in many and varied conditions; careful consideration is given to many subjects, particularly these subjects which are most essential for the practical nurse; anæsthesia is well discussed. The chapter on nutrition with its excellent pictures of rickets and food deficiency diseases deserves special mention. Prenatal community work and the care of the baby are given very full consideration. The young mother could read most of the less technical part of the work with pleasure and interest. The greatest possible credit is due the author; the publishers are to be complimented upon the appearance and the printing of the volume. N. B. G

Books Received

Diseases of the Stomach and Upper Alimentary Tract—By Anthony Bassler, M.D., F.A.C.P. Fifth Edition, revised and enlarged. Illustrated with 151 engravings and 93 plates. Price $8.00. Published by F. A. Davis Co., Philadelphia, 1922.

Chloroform Anæsthesia By A. Goodman Levy, M.D., M.R.C.P., with a foreword by Arthur R. Cushny, M.D., LL.D., F.R.S. Price 7s. 6d. net. Published by John Bale, Sons & Danielsson, Ltd., 83 Great Titchfield Street, Oxford House, London, W.1., 1922.

A System of Clinical Medicine—By Thomas Dixon Savill, M.D., Lond. Sixth Edition, Illustrated, 914 pages. Price 28s. net. Published by Edward Arnold & Co., 41-43 Maddox Street, London, W.1., 1922.

Clinical Diagnosis—Case Examination and the Analysis of Symptoms, by Alfred Martinet, M.D., Paris, France, with 895 text engravings and several full-page color plates. Complete in two volumes. Published by F. A. Davis Co., Philadelphia, 1922. Price $14.00 two volumes.

Diseases of Infancy and Childhood—their Dietetic, Hygienic, and Medical Treatment—By Louis Fischer, M.D. Ninth Revised Edition. In two volumes. Volume I: Infant Feeding and Organic Diseases, with 146 illustrations and 37 colored plates. Volume II: Infectious Diseases, Cerebral Diseases; Orthopedic Surgery and Diseases of Eye, Ear, Skin, etc., with 147 illustrations and 43 colored plates. Price, Volumes I and II, $12.00. Published by F. A. Davis Co., Philadelphia, 1922.

Diagnosis, Prognosis and Early Treatment of Poliomyelitis The conclusions presented by Robert W. Lovett, Boston (*Journal A.M.A.*, May 27, 1922), are based on a study of 5,100 cases of poliomyelitis. No summary of this paper can be given, as it is at best only a summary of a large field. The important points are that the diagnosis must not be made on the history, but on the physical examination; that tenderness is a guide of great importance in diagnosis, prognosis and treatment; that early treatment consists of rest, and that, in the convalescent phase, muscle fatigue is the chief danger and muscle reeducation the chief reliance, and deformities prevent proper function and promote muscular deterioration. Lovett asserts that if these points are borne in mind, many patients can be spared much unnecessary deformity and disability, and we shall be able to take a much more hopeful view of the outcome of poliomyelitis.—*Jour. Am. Med. Ass.*, July 22, 1922.

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M.C. 12

Treatment of Tuberculosis.—At a meeting of the Tuberculosis Society of London, on April 24th, there was a prolonged discussion on the therapeutics of tuberculosis. The chair was taken by Dr. F. R. Walters, who in his opening paper emphasized the importance of adequate treatment of slight fever in pulmonary tuberculosis, and suggested that slight attacks were so often neglected because no adequate temperature record was taken. The general practitioner should deal with slight fever far more strictly, and the worst thing that could be done was to tell the patient he must walk about out of doors. In the early stages there should be a combination of rest and fresh air. The patient must be kept warm, while having plenty of cool air to breathe. There should be physiological as well as physical rest, and an absence of all emotional disturbance, worry, or excitement. Treatment causing fatigue should be avoided as much as possible, and in some feverish cases, in dealing with patients in an institution, it might be necessary to restrain the nurse's excessive zeal for washing. It was always a great mistake to tire the patient out. Dealing with various remedies, Dr. Walters said there was a distinct place for creosote, but it should be prescribed rather in a liquid form than in capsules. It should be well diluted and given after meals. In his own experience, continuous inhalations had been rather disappointing. There were cases of irritating cough where the remedy might be very useful, but a great drawback was the fact that patients who had been under fresh-air treatment much resented having what they called "muzzles" put upon them. Speaking of more serious attacks of fever, Dr. Walters said he felt strongly on the question of diet. He had known a man to lose his chance of recovery because the practitioner who treated him in the early stages of the febrile attack put him on low diet. The patient ought to be fed to a reasonable extent on digestible food, but not on slops. In regard to hæmoptysis, complete rest was of course necessary in severe cases. The patient should be kept in a recumbent position, and not flat on his back. Cool air was essential. Ice to suck was of little value, except as an adjunct to prevent thirst. Silence was important. He was strongly opposed to the routine treatment by morphine. The patient could be quieted in other ways. Inhalations of turpentine proved very useful. In severe hæmorrhage the amount of liquids taken should be restricted to 15 oz. a day. The intermuscular injection of calcium chloride had been found very effective. Dr. Neville Cox read a paper on artificial pneumothorax, which he thought was the greatest advance in the treatment of pulmonary tuberculosis made in the past fifty years. Pointing out how difficult it was to tabulate statistics he claimed that if only 1 per cent. were saved by the treatment it would be well worth while. There were of course the risks of gas embolism and pleural shock. These might be avoided by careful technique. In his own experience since the war he had never used the treatment except when what he might call the classical indications were present—that is, extensive, progressive, apparently unilateral cases, with abundant bacilli and persistent fever. Probably suitable cases would not comprise more than 3 or 4 per cent. in a sanatorium. Dr. Neumann, of the Schatzalp, Davos, said about 12 per cent.—*Brit. Med. Jour.*, April 29th, 1922.

Meat and Scurvy.—The experimental investigations of Vedder of the U. S. Army at Fort Sam Houston, Texas, corroborate previous guinea-pig tests in showing that the administration of considerable amounts of erythrocytes, voluntary muscle, heart muscle and bone all failed to prevent the development of scurvy, or even to prolong the depletion period. An antiscorbutic factor is not present in these tissues in appreciable quantity. On the other hand, various viscera—the liver, lungs, spleen and pancreas—as well as the brain evidently possess antiscorbutic powers, as has long been known for the liver in particular. This demonstration in respect to glandular organs may account for native customs among tribes who live chiefly on a meat diet. Many of them esteem the organs as dietary tidbits. Vedder states that when the plains Indian had been without game over a considerable period, he was accustomed to open the freshly killed bison and eat handfuls of raw liver. It is stated that the Eskimos make a special effort to secure the liver of the seal, and that when hunters had Apache Indians as guides, the usual bargain was for the guides to take all the insides of the deer, leaving the meat for the hunters. Perhaps the seemingly unusual customs become susceptible of a plausible explanation in the light of the newer knowledge of nutrition. Perhaps, further, the distinction between meat, in the sense of muscular tissues, and glandular organs such as the liver and kidney, has not always been made by those who have reported dietary habits in relation to human scurvy.—*Jour. A. M. A.*, June 24th, 1922.

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GALL-BLADDER PROBLEMS*

William Boyd, M.D., M.R.C.P. Ed., Dipl. Psych.

Professor of Pathology, University of Manitoba—Pathologist, Winnipeg General Hospital.

When the surgeon opens the abdomen in a case which he has correctly diagnosed as one of gall-bladder disease he may find one of three conditions.

1. There may be an acute cholecystitis.
2. There may be a chronic cholecystitis.
3. The gall-bladder may show little if any deviation from the normal, apart from a few tell-tale adhesions, but when it is opened the surface is seen to be flecked with little yellow spots and streaks, which suggest so strongly the seeds of a strawberry that the name of "strawberry gall-bladder" has been given to the condition.

This yellow material has been shown by MacCarty,[1] to be of the nature of a lipoid or fat-like substance. An investigation into the nature and character of this lipoid has opened up a number of new lines of thought with regard to gall-bladder pathology. The methods employed were at first histological, but as the work advanced it was necessary to employ chemical and experimental methods, and finally aid had to be invoked from comparative anatomy.

In a paper of this length a full discussion of methods would be out of place. The ordinary fat stains such as Sudan iii, Scharlach R, and osmic acid were used. Lorrain Smith's Nile Blue sulphate method served to distinguish neutral fats from fatty acids. New micro-chemical methods were employed. Brief reference must, however, be made to one method to which sufficient attention has not been paid.

The low power binocular microscope or dissecting microscope gives one an idea of the structure of the gall-bladder in health and disease such as is furnished by no microscopic section, however well it may be stained. When a normal gall bladder immersed in water is viewed under such a microscope a strangely beautiful picture is spread before one's eyes. One might be gazing into the depths of some marine pool in which exquisite sea-weeds were waving their delicate fronds. The anatomical text-books tell us that the mucosa of the gall-bladder is thrown into folds, but here we see rising up tall delicate membranes, thin as gossamer, covered by a delicate tracery of blood vessels, dividing the mucosa into a series of tiny court yards sunk like wells between the surrounding walls. Such a structure is seen nowhere else in the body, and it has a bearing on function the importance of which will be referred to in due course.

The finger of disease leaves its indelible mark upon this delicate structure as surely as the brilliance of a mirror is tarnished by the slightest breath. The gossamer walls become coarse and thickened, the little courtyards open into one another, and as sclerosis advances our marine pool seems to have dried up and all the wonderful flora withered away.

The picture presented by the strawberry gall-bladder is one of equal interest. The delicate folds are now thickened and opaque, and the peculiar yellow material stands out in startling contrast to its surroundings. It can be traced along the ridges, but never continuously, for the deposits are essentially discrete. It is most marked on the summit of the ridges, and is often confined to that position, but in some cases it can be traced down the sides into the intervening depressions. We note at the same time that the pathological process is not really an advanced one. The folds still retain much of their original form, although coarsened and degraded. The end stages of the inflammatory process, the stage of destruction and scarring, is marked by a complete disappearance of the yellow deposits.

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Turning now to the microscopic picture of the strawberry gall-bladder we find that the yellow material stains well with the usual fat stains; it appears red with Scharlach R and black with osmic acid. But the polarising microscope at once shows that we are not dealing with neutral fat, the glycerine ester of oleic acid. That substance, being isotropic, is invisible when viewed under crossed Nicol's prisms. But the lipoid in the strawberry gall-bladder is anisotropic; it shines against the black background with a beautiful and silvery light. This phenomenon at once suggested that the substance was either cholesterol or some compound of cholesterol, for these bodies, as is well known, are doubly refractive in the highest degree. Our further efforts had as their object first to determine, with as great exactness as possible, the precise nature of the substance, and second, to ascertain, if that might be, the significance of these peculiar deposits.

Before pursuing this subject let us first consider the distribution of the lipoid as seen in microscopic sections stained with Scharlach R. In ninety-eight gall-bladders examined, lipoid was found microscopically in fifty-one. In only ten of these could the lipoid be seen with the naked eye or with the aid of the dissecting microscope. The remaining cases were, therefore, not classed as strawberry gall-bladders. First and foremost it is found in the *epithelium* and particularly in that covering the villi. At times the lipoid is seen as a thin red line running along the base of the epithelium internal to the nuclei, at other times it forms great masses here and there with intervening areas practically unaffected. In other cases the lipoid is concentrated in the *stroma* of the villi. Here it may be either intracellular or extracellular. The cells which contain the lipoid are mainly of the mononuclear series, but many elongated cells, which one takes to be fibroblasts, may also be filled with it. Sometimes there appears to be a regular trail of lipoid which can be traced from the surface epithelium down through the stroma into the deeper fibrous layers. Occasionally the lipoid is found in the *fibrosa*. Here it is practically confined to the interior of fibroblasts and mononuclear cells. Moreover, it is found in the endothelium lining the small blood vessels, and, most amazing of all, actually within the lumen of the vessels. Whilst there is the danger that we may have misinterpreted the picture, and that the appearance is but an artefact, yet in a number of instances the lumen of the vessel was dilated at the spot occupied by the lipoid globule, and the vessel walls appeared to curve around it.

To describe these appearances is easy, to explain them is another matter. In fact no explanation could be attempted until the exact nature of the lipoid was accurately determined. Even without that knowledge, however, it was possible to formulate some ideas concerning the relation between the deposits and the presence of inflammation. It may be said at once that inflammation was present in every case. That inflammation was never acute. Nor was lipoid found in very long-standing cases of chronic inflammation with extensive fibrosis. It was present in greatest amount in those cases which showed a mild inflammatory reaction in the mucosa, with even less evidence of trouble in the fibrous coat. Some congestion of the vessels, a varying amount of œdema, an infiltration of the loose stroma of the villi with lymphocytes and plasma cells but usually without the slightest desquamation of the delicate surface epithelium; surely these slight changes could hardly be expected to produce so remarkable a deposit.

Here we ask ourselves: is this really a deposit? May it not be that here we have merely the unmasking of an invisible lipoid, rather than any real fresh deposits? A heart or a kidney the seat of profound fatty degeneration as evidenced by staining with Scharlach R may, when examined by quantitative chemical methods, be found to contain no more fat than the normal organ. What is normally hidden has become revealed, nothing more.

Before seeking an explanation let us see if an excursion into comparative anatomy will throw any light on the problem. The dog was the animal first chosen, and sections of the gall-bladder were stained in the routine way with Scharlach R. Naturally we did not expect to find any trace of lipoid. Imagine one's astonishment when the surface epithelium was seen to be dyed a vivid red, owing to the presence of innumerable lipoid globules which packed the cells.

Twelve dogs were examined in all, and in every one the appearance was the same. It was confined to the epithelial cells, and was never found in the stroma. No signs of inflammation were detected, and the presence of the lipoid was evidently a normal occurrence. The gall-bladder of the cat, the cow, the rabbit, the guinea pig, and the frog were examined. Only in the cat was lipoid found, and then only occasionally and in small amount.

This lipoid material in the normal gall-bladder of the dog, hitherto undescribed, appears to be quite different from the material of the strawberry gall-bladder in man. For one thing it is seldom brilliantly anisotropic. For another it does not react with the sulphuric acid test about to be described. In the dog, therefore, we find under normal conditions what appears to be a glycerine fat, whereas in the diseased gall-bladder of man we find deposits of what is probably a cholesterol fat.

Let us turn back for a moment and decide once and for all the nature of the material we are discussing. We have seen that the substance is a lipoid; it stains with the ordinary fat stains and is soluble in the ordinary fat solvents. Moreover it is doubly refractive under Nicol's prisms, so that the presumptive evidence is that it is related to cholesterol. It was felt, however, that if only one of the chemical tests for cholesterol could be applied to the tissues the matter would be placed on a much more certain footing.

Most of these tests are quite inadmissable in histological work. Many years ago, however, Moleschott showed that when concentrated sulphuric acid, diluted with one part of water to five of the acid, is added to cholesterol crystals, the latter take on a beautiful carmine red. This was the method we selected for tissue work. A frozen section of a strawberry gall-bladder was fixed on a slide and dried very thoroughly. The acid was then poured in a gentle stream over the section. After overcoming certain technical difficulties which need not detain us here, we had the pleasure of observing that the lipoid assumed first a yellow colour, and then a reddish brown or rather a henna. This was not the reaction for cholesterol, but could it be that for the ester of cholesterol? The ester was prepared, spread as a film on a slide, and treated with the acid. The result was a terracotta brown, practically identical with that seen in the gall bladder. The adrenal cortex, so rich in cholesterol ester, gave an identical reaction. Moreover the lipoid in the sections, after treatment with the acid, became invisible under Nicol's prisms, and it was found that the ester, but not the cholesterol crystals, behaved in exactly the same way. We now felt certain that the substance we were dealing with was the ester of cholesterol with a fatty acid, and that in addition we were now in possession of a test which would demonstrate cholesterol ester in whatever tissue it might occur.

Two further observations may be cited in support of this view. First, the Maltese crosses which form so striking and beautiful a feature of the polariscopic picture of cholesterol ester were seen in a number of cases in the immediate vicinity of the lipoid masses. And second, when the lipoid was examined in frozen section, unstained, with the diaphragm almost closed it was frequently seen to be in the form of fine acicular crystals, these needles being even more distinct under the polarising microscope. According to Aschoff cholesterol in formalin-fixed tissues is found in this same acicular form.

Armed with assurance as to the substance with which we are dealing, let us now turn afresh to the question of whether the increase in the lipoid is real or only apparent. For this purpose chemical methods are necessary. A portion of the wall of the gall-bladder was taken, the mucosa removed under the dissecting microscope from the fibro-muscular coat, dried, weighed, the lipoid extracted, and the cholesterol estimated by the Bloor method. This was done with a normal gall-bladder and with a series of strawberry gall-bladders. It will be seen from the results contained in Table I that the increase of cholesterol in the strawberry cases was in many instances most remarkable. In one case there was 60 per cent. of cholesterol by weight compared with 0.5 per cent. in the normal, or 120 times as much. The increase was therefore real, and not merely apparent. Table II shows the findings in a peculiarly interesting case in which two-thirds of the gall-bladder showed advanced inflamma-

TABLE I

Showing varying cholesterol content of the gall-bladder in different conditions.

Type of Gall-Bladder	*Per Cent Cholesterol by Weight*
Normal Gall-Bladder	0.51
" "	1.70
Inflamed " (No lipoid)	0.36
Strawberry " No. 8-22	60.54
" " No. 160-22	46.40
" " No. 416-22	34.60
" " No. 624-22	50.45
" " No. 465-22	51.00
" " No. 839-22	41.80

tory changes but with no lipoid visible to the naked eye, whereas the remaining third, including the neck of the gall-bladder, presented a marked strawberry appearance, but comparatively slight inflammatory change. The latter contained two and a half times as much cholesterol as the former. The theoretical interest of this case is great, for the part showing advanced inflammation must surely represent a late stage of the condition still prevailing in the strawberry portion, and yet what has happened to the lipoid? A question at present unanswerable.

TABLE II

Showing how the cholesterol content may vary in different parts of the same gall-bladder.

	Mucosa *Per Cent.*	*Fibrosa* *Per Cent.*
Part showing advanced inflammatory change......	16.30	0.10
Part showing slight inflammation but marked strawberry appearance	41.80	0.17

There is one last question: What is the cholesterol doing in the wall of the gall-bladder? How does it get there? Writers of great pith and moment have asserted that the gall-bladder mucosa produces cholesterol. While much of the cholesterol of the bile is produced by the liver, much, they say, is secreted by the gall-bladder, especially in conditions of catarrhal inflammation. Hence the increased concentration of cholesterol in gall-bladder bile as compared with liver bile.

With such a view one cannot for a moment agree. A consideration of the wonderful anatomical arrangement of the gall-bladder mucosa leaves one impressed with the conviction that the prime function of the organ must be absorption. The recent work of Rous and McMaster[2] has shown that a large amount of water is absorbed. My own opinion is that cholesterol is also absorbed. The evidence on which this opinion is based is not yet ready for presentation, but one or two observations may be given.

The first step was to determine whether solids in a state of solution could be absorbed. For this purpose the Prussian blue reaction was employed, just as was done by Weed in his investigation into the absorption of the cerebrospinal fluid. The gall-bladder of a dog was exposed, aspirated of bile, and an equal quantity of a 2 per cent. solution of iron ammonium citrate injected. Half an hour later the gall-bladder was removed, fixed, and treated with potassium ferrocyanide and hydrochloric acid. If the iron was absorbed the granules of Prussian blue produced would be found within the wall. They were found there, both in the epithelial cells and in the stroma.

The final problem as to whether cholesterol itself is absorbed, and if so in what amount, has not yet been solved, for our investigations are not as yet completed. The following observation, however, is at least suggestive. The blood cholesterol of five rabbits was determined, and the average was found to be 25 milligrams per 100 cc. The rabbits were then given 0.1 gm. of cholesterol in a gelatin capsule every day. After four days the gall-bladder was removed from two of the animals. The feeding of cholesterol was continued. On the ninth day the blood cholesterol of all the rabbits was estimated. The results are given in Table III. It will be seen that whereas in the control rabbits the average of the cholesterol had risen to 33 milligrams, in those in which the gall-bladder had been removed it had fallen to 21.5 milligrams.

TABLE III

Illustrating the effect of cholesterol feeding and cholecystectomy on blood cholesterol in the rabbit.

Control (average).....	25	milligrams per 100 c.c.
1. Fed cholesterol........	38	" " " "
2. " "	30	" " " "
3. " "	32	" " " "
4. Cholecystectomy.......	21	" " " "
5. "	22	" " " "

The blood cholesterol is derived from a dual source. The first supply comes from the food and must be absorbed by the intestine. The second supply is the cholesterol in the bile which, as Dorée[3] and his associates have conclusively shown, is not lost to the body— it is too valuable for that—but is reabsorbed in some place hitherto undetermined. The result of the experiment just described would suggest that that place is no other than the gall-bladder and that it is this circulating cholesterol, the cholesterol taking part in what has been called the cholesterol cycle, which becomes deposited in the mucosa of the strawberry gall-bladder.

If this be true the observation is one of considerable importance. Not only does it throw light upon the behaviour of cholesterol in the body, and upon the function of the gall-bladder. It also suggests that, in some cases at least, gall-stones actually originate in the gall-bladder mucosa, and later become detached and grow because of additional deposits of cholesterol and bile pigment. Some of our microscopic sections, indeed, show a great mass of cholesterol attached to the mucosa by the thinnest of stalks, ready to be detached by the merest touch. The relation of lipoid deposits to the formation of gall stones must, however, be reserved for a future communication.

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PLEURISY AND TUBERCULOSIS

D. A. Carmichael,

River Glade, N.B.

ALTHOUGH pleurisy is a relatively common disease, our experience has shown that with the exception of empyema, we often fail to appreciate its true significance and as a consequence, treatment is inadequate and the end results disastrous. It is the purpose of this paper to emphasize the importance of the tubercle bacillus as a causal agent of dry and sero-fibrinous pleurisy and to direct attention to the special indications for treatment resulting from that etiology.

That the commonly occurring pleurisy with effusion, is caused by the tubercle bacillus in many cases is universally admitted. There is, however, a rather wide diversity of opinion as to the exact percentage of cases in which this organism is present. The finding of a tuberculous focus elsewhere in the body, especially in the lungs or in the mediastinal glands is, of course, accepted as evidence that the pleurisy is tuberculous and secondary. It is the so-called primary or idiopathic case which offers the difficulty. A search for the tubercle bacillus in the exudate is not often successful. Even when large amounts are digested and concentrated by centrifuge the bacillus is not found in more than 20% of cases. By animal inoculation a higher percentage is revealed, and when large amounts, 15 c.c., or more are injected and the injections repeated, positive results as high as 85% have been obtained. The preponderance of lymphocytes in the fluid is of some significance but the cytology varies greatly with the acuteness of onset and symptoms, with the time elapsing from formation to withdrawal and even with the point of the puncture, since cells will gravitate to the lowest point, so that too much stress should not be placed upon excess of any particular type of cells. A marked eosinophilia may be taken as in a majority of cases ruling out tubercle. An insidious onset, an effusion reaching a large size before the occurrence of symptoms and a tendency to recur are all very strongly in favour of a tuberculous origin. A careful history of previous health will often reveal a period of ill-health which frequently can be shown to have been due to tuberculosis; the after history is of great importance, not only that of the weeks immediately following the illness, but that of several years subsequently.

Insurance statistics establish a mortality from tuberculosis among the insured giving a history of pleurisy within five years preceding insurance, which is three times the mortality of insured individuals having no history of pleurisy. Of eleven ex-soldiers in whom no primary tuberculous focus could be found during the several months hospitalization following pleural effusion occuring during 1918 and 1919, nine have since been re-admitted for treatment with definite signs of pulmonary involvement, leaving only two who after four years or less are presumably free from tuberculosis. The percentage of primary or idiopathic pleurisy with effusion that has been definitely proved tuberculous, in the series of various authors, varies from a minimum of 22 to a maximum of 85%. Fishberg believes that 40% subsequently become tuberculous and that all these will develop within five years. Norris and Landis, Lord, Osler and MacCrae state that the percentage is more than fifty, while West states that certainly 50% and probably 75% are definitely tuberculous and the four authorities would treat every case as tuberculous until proven otherwise and would continue treatment for a sufficient period of time to insure arrest of disease. It is evident that the only safe course in dealing with sero-fibrinous pleurisy even if no tuberculous focus in lungs, glands or other organs can be found, is to bear in mind its probable tuberculous origin and treat accordingly, not only during the acute period but for months subsequently.

Mention should be made of the pleural effusion due to pneumococcus, occurring without the usual pneumonic consolidation and most often met with as a primary effusion or empyema in childhood. If not frankly purulent, this effusion is turbid, runs an acute course and its non-tuberculous nature is proven by the cultivation of the pneumococcus.

Two series of experiments seem to strongly corroborate the evidence as to the role of a previous infection in the production of effusion either purulent or serous. Floyd concluded from his series of experimental infection of the pleura with pyogenic organisms that only when previously sensitized for a few days, *i. e.*, by previous infection, does empyema follow the introduction of pyogenic cocci into the pleural sac. Patterson, working with tubercle bacilli, showed that only in allergic animals, *i. e.*, previously tuberculous animals, does effusion follow introduction of living tubercle bacilli into the pleural cavity. These two series of experiments offer the only rational explanation of the variable response of the pleura to trauma, whether it be external injury or penetrating wound of the chest, the latter of which has been so frequently encountered in ex-service men. Many of those with bullet or shrapnel wounds of the chest made rapid and apparently complete recovery without effusion or empyema. Some developed empyema, and according to Floyd's experiments were already sensitized, presumably by infection of the subpleural lung tissue and the pleura itself. Others developed serous effusion which remained serous, and these according to Patterson's studies, were already allergic to tubercle bacilli by reason of previous infection, sufficiently recent not to have become obsolete.

The most typical dry pleurisy is that encountered with lobar pneumonia and which is, of course, secondary to the pneumonic process in the lung and caused by the pneumococcus. This is fibrinous pleurisy, involving a large area of pleura, usually basal and accompanied by sharp pain or stitch and evidenced by the typical to and fro friction rub. There are many cases of dry pleurisy which do not accompany pneumonia and are usually called idiopathic. These may be severe or mild, acute or chronic, may involve a large area, but more often are confined to a smaller area, in the axilla, the pectoral, the parasternal or the scapular region or to an apex or the diaphragm. Leaving signs and symptoms for later consideration, let us inquire into the etiology of these so-called idiopathic cases.

This has been assigned to a variety of causes, trauma, exposure to cold, rheumatism, gout, specific fevers as typhoid and most frequently to extension from adjacent parts, such as chest wall, lung, pericardium, mediastinum, diaphragm or spine. The last two groups have a primary focus which is obvious in the majority of cases and may or may not be tuberculous. The only evidence of a gouty origin of pleurisy is the finding of gouty deposits in the pleura at autopsy. Rheumatic fever must be an extremely rare primary cause, pleurisy being found in only 4% of a large series of cases of rheumatic fever and then it was dry, of short duration and ran a simple course. If we bear in mind the frequency with which extensive rib fracture occurs without pleurisy following, trauma will not be a satisfactory explanation unless injury of lung or severe damage of chest wall is demonstrated. With the modern knowledge of the rôle of bacteria, exposure to cold may be disregarded except as favouring the development of organisms through lowered resistance.

Practically all authors are convinced that dry pleurisy, when occurring in the absence of disease in adjacent tissue or of specific fevers such as typhoid, is to be considered due to tubercle bacillus and to the same extent as pleurisy with effusion. Syphilis may be a possible cause, but at present accurate statistics are lacking, since only in recent years has it been possible to demonstrate the spirochæte.

From autopsies and from the subsequent histories, it is established that the great majority of "idiopathic" dry pleurisies are due to the tubercle bacillus. The percentage is believed to be the same as that of pleural effusion, at least 50% and most probably 75 or 85%, and again we emphasize the importance of directing treatment in accordance with the probable tuberculous nature of the disease.

The signs and symptoms of pleurisy with effusion are known to every physician. Its diagnosis is seldom difficult and can usually be established by the exploring needle. The typical dry pleurisy with well marked friction is even less obscure. But dry pleurisy is often remarkable for the absence of recognizable physical signs and the mildness of its symptoms. A localized area in any part of the chest, even the axilla, may fail to show appreciable change to percussion; friction rub is more frequently absent than present; at most only a few rales indistinguishable from intrapulmonary sounds or muscle or joint sounds are found on auscultation, and breath and voice sounds remain normal. While the pain may be severe, it will more often be only an ache, or felt only after exertion, coughing or deep breathing, or towards the end of a tiresome day. Its recognition will depend on its persistence, its tendency to recur and on a close observation of the general health of the patient.

Dry pleurisy of an apex may at times be recognized by a friction rub or by a superficial crackle on deep inspiration. Often signs are lacking, especially if adhesions have formed. It seldom produces acute pain, but usually a dull ache of the shoulder or beneath the scapula. It may be recognized from inequality of the pupils, sweating of half the face, flushing of one cheek, all resulting from sympathetic involvement. The presence of an enlarged gland at the inner end of the clavicle under the sternomastoid, is, according to Fishberg, pathognomonic of tuberculous pleurisy. Apical pleurisy may represent abortive tuberculosis leaving only an adherent apex or it may persist or recur and in the latter case, a pulmonary lesion sooner or later is evolved. Often it is really secondary to an underlying lung lesion, which we may or may not be able to discover on examination. The x-ray may establish the diagnosis when lung parenchyma is involved, but in pleural involvement only, it may merely show a veiled or ground glass appearance of the apex which is not of itself diagnostic, being frequently found in apparent health. The presence of either signs or symptoms of apical pleurisy, no matter how slight, should lead one to search for constitutional symptoms, slight fever, rapid pulse, loss of weight, fatigue, digestive disturbance, persistent dry cough, and the other symptoms of early tuberculosis.

The differential diagnosis of dry pleurisy, either acute or chronic, is often difficult and especially if physical signs are not in evidence. It had to be differentiated from rheumatism of shoulders or intercostal muscles, from muscular strain due to cough, pleurodynia, intercostal neuralgia, herpes zoster and disease of chest wall or spine. Regarding rheumatism, we have already seen that only 4 per cent. of cases of rheumatic fever have pleurisy which is always benign and of short duration. Chronic rheumatism belongs to the ages of forty and after, while the years from twenty to forty are those of greatest tuberculous incidence. Fishberg says, "Pain in shoulder which may become severe and intractable is not to be pronounced 'rheumatic,' but a search made for apical or diaphragmatic pleurisy." In the absence of rheumatism elsewhere in the body or history of its recent presence, a diagnosis of rheumatism is unjustified and most certainly should not be made until dry pleurisy and tuberculosis are excluded.

Intercostal neuralgia is characterized by neuralgic (jumping) pain, rather than a stitch or ache; there are tender points where branches reach the superficial tissues. Neuralgia presupposes the existence of an exciting cause, such as a lesion of the spine. Lord says, "A diagnosis of intercostal neuralgia or pleurodynia amounts to a confession of ignorance." The appearance of the local lesion is sufficient for differential diagnosis in herpes zoster which may follow true intercostal neuralgia, and in lesions of the chest wall and spine. The frequency of dry pleurisy as shown by autopsy is such that the probable diagnosis is always pleurisy, unless one of the other conditions can be established beyond question.

The treatment required during an attack of pleurisy, either dry or sero-fibrinous, is exceedingly simple, consisting of rest in bed until fever and pain subside, the administration of laxatives, analgesics and dieting in accordance with the symptoms of the individual case. The application of heat or cold, mild counter irritation with iodine or strapping may be useful in controlling pain. Excepting thoracentesis which may be urgently indicated in certain cases, there is no specific treatment of pleurisy. In fact serious and well-founded objections can be presented to practically every other procedure or mode of treatment which is advocated and the numbers and variety of such treatments are, to say the least, bewildering. We need not discuss these here.

With thoracentesis, should be combined replacement of effusion by oxygen, nitrogen or air, the co-called pneumoserosa of French literature. This latter treatment is also advocated by some in dry pleurisy, in which separation of the inflamed surfaces affords instant relief of pain, favors early subsidence of the inflammation and tends to prevent adhesions and further effusion. Pleural effusions reaching to or beyond the spine of the scapula should be aspirated at once, although some authorities would wait for a day or two in the hope of spontaneous absorption beginning, provided the patient's condition remained satisfactory. The occurrence of severe dyspnœa, cyanosis, cardiac distress or signs of oedema in the opposite lung are absolute indications for immediate thoracentesis, regardless of the size of effusion. Bilateral effusion is also to be considered a positive indication for tapping. In all other cases of pleural effusion, thoracentesis is not positively or urgently indicated, and its employment is largely one of personal choice. The writer favours non-interference for two or three weeks in the average case, in the hope of spontaneous absorption beginning. If after that time no evidence of beginning absorption can be found, or if the effusion is increasing, withdrawal of fluid is advised.

Before aspiration of fluid is undertaken, whether in urgent cases or because regarded as desirable for general reasons, it is of the utmost importance that the etiology of the effusion be first decided. Unless definitely able to exclude it, the tubercle bacillus is to be considered the offending organism and it is extremely important to determine the presence or absence of a tuberculous lesion in the lung of the diseased side. If there is tuberculous involvement of the lung or if there is evidence of active tuberculosis as indicated by symptoms or history, modern practice demands that fluid be replaced by air, oxygen or nitrogen. Failure to do this almost invariably results in adhesions which render subsequent treatment by artificial pneumothorax impossible, should it become necessary or desirable. It has been our experience that pneumothorax all too frequently offers the only chance for life that we can offer to many of the 85 per cent. who subsequently become or were already tuberculous. Failure to recognize the tuberculous nature of pleural effusion and failure to search out the tuberculous lesion in the lung or the tubercle bacillus in the sputum means disaster sooner or later to many a patient who is treated regardless of this condition.

In the patient in whom no primary focus or history of previously active tuberculosis is found, the case must be carefully observed during several weeks succeeding the pleurisy to determine the presence or absence of such signs or symptoms as would establish the diagnosis of tuberculosis. Among them slight fever, rapid pulse, loss of appetite persisting after the acute period, continued loss of weight, slow and incomplete convalescence, persistence of slight cough are all of tremendous import. In these cases also, gas replacement is the correct procedure until diagnosis and prognosis are definitely determined.

Gas replacement of pleural effusion has many advantages to commend it: (1)All fluid can be withdrawn at one sitting; (2) It is followed by rapid healing in most cases, and the exudate seldom returns; (3) Formation of adhesions or extensions of existing ones is prevented; (4) Pain is relieved instantly and completely; (5) Shrinkage of thorax is counteracted; (6) Danger of rapid decompression is minimized or averted; (7) Danger of laceration of lung is lessened; (8) Concommitant tuberculosis can be treated and treatment continued; (9) It assists in diagnosis and prognosis, affording time for their more exact determination. Of vastly more importance to the patient, than the treatment during the attack, is the after care. "The physician's responsibility does not end with the disappearance of acute symptoms, no matter how mild or how reassuring the general condition, permanent results require supervision at regulat intervals *for a long time.*"

Every case should be warned of the possibility and probability of tuberculosis, and should be treated in accordance with present day standards for the treatment of tuberculosis. It may be necessary to change from an unfavorable occupation, to seek more hygienic living quarters, to avoid strenuous labor or sports; many may be allowed to continue their usual employment under frequent medical supervision. If a lesion of the lung is recognized or if symptoms of active tuberculosis are present, then the hygienic treatment of tuberculosis, either at home or at a sanatorium, is imperative, and such supervision as may be required should be continued over a sufficient period of time.

Summary

(1) Dry or sero-fibrinous pleurisy, acute or chronic, is to be considered tuberculous and treated as such, unless tuberculosis can be absolutely excluded.

(2) A diagnosis of intercostal neuralgia, rheumatism or pleurodynia is only to be made when.

adequate cause can be shown. Pain of any degree about the chest should arouse suspicions of tuberculous pleurisy.

(3) Favorable end results in the treatment of pleurisy can only follow the recognition of the place of the tubercle bacillus in its etiology.

(4) Thoracentesis is not necessary in every case of pleural effusion, but whenever aspiration of fluid is undertaken, air should replace the fluid withdrawn unless tuberculosis has been positively excluded.

(5) Aside from its use in artificial pneumothorax, the introduction of air into the pleural sac is the most satisfactory known treatment of pleural effusion, no matter what its etiology.

(6) An essential treatment of tuberculous pleurisy is after care of the patient for months and years.

THE USE OF CIRCULATORY STIMULANTS IN THE CARE OF THE SICK*

Robert Dawson Rudolf, C.B.E., M.D., Edin.

Professor of Therapeutics, University of Toronto

WHAT is a stimulant? Definitions are notably difficult and unsatisfactory, but that given of a stimulant, in the *New English Dictionary* appears to me to be the best; *viz.*, something that temporarily quickens some vital process, or the function of some organ. That in *Nelson's Encyclopædia* is also good—medicinal agents which increase the functional activity of a living organ, and which, at least in some cases, induce slightly increased irritability of living tissues.

Stimulants, of course, are not always drugs. Food, heat, various reflex impulses, all increase function, as do also emotions, as joy and hope, but to this last aspect of the subject we will return.

The object of a good circulation is the keeping up of a sufficient arterial pressure for the carrying on of the functions in the various organs. Anything which will improve the arterial blood pressure when this tends to fail is a circulatory stimulant. Stimulants differ from tonics in that their action is more speedy and transitory, but they are usually considered together in medicine and we will do so here.

The ways in which stimulants increase function are very complicated and differ in different instances. As Meyer and Gottlieb put it[1] "Increased discharge of energy—that is to say increased functional activity, or stimulation—results alike from the removal of inhibiting forces or the introduction of accelerating ones."

A horse can be made to go better by increasing its food supply, by loosening the reins, or by the use of the whip or other urging influence. The food increases chemical changes in the tissues, the loosening of the reins lessens inhibition, while the whip is an external stimulant. In the same way, the heart can be caused to do more and better work by improved nutrition, by lessening the influence of the vagus, or by stimulating the sympathetic—the whip of the heart. Sugar and alcohol will specially act in the first way, atropine and to a lesser extent alcohol in the second, while the sympathetic can be stimulated directly by adrenalin and tyramin or reflexly by swallowing strong alcohol or ammonia, and the muscle directly affected by digitalis and caffeine and probably the diffusible stimulants as ammonia and ether.

The measurement of the effects of stimulants in a given case is often a difficult matter, and one must frequently be guided by the general improvement in the patient and his increased *bien etre* rather than by any very definite signs. For instance, the blood pressure is a poor guide. Thus, atropine immensely increases the action of the heart and yet rather tends to lower the arterial pressure. Digitalis slowly strengthens the heart but seldom raises the blood pressure unless this be already low because of a failing heart.

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The rate of the heart, again, is an uncertain indication. Atropine increases it and digitalis lessens it and yet both increase the work done by the organ. Often the pulse rate and the blood pressure will remain unaltered and yet the patient feels and is better. I recall a case of complete heart block who was having frequent attacks of the Stokes-Adams' syndrome but as long as he took digitalis he remained free from these, and yet we could detect no alteration in the rate of either auricles or ventricles and the blood pressure remained unchanged. Phair and Parkinson[2] recently record a similar case where a similar result was obtained from the use of adrenalin although no change in the heart block occurred and the ventricular rate remained unchanged.

The stethoscope, the sphygmograph and the electro-cardiograph are valuable instruments but many of the circulatory changes are far too delicate to be appreciated by them. The skilled eye of the physician can often recognize slight changes for good or for evil in his patient's state which cannot be shown instrumentally.

The *New Standard Dictionary* gives emotions, such as joy and hope, as stimulants, and it behooves us always to remember this. A cheerful environment, a hopeful prognosis, will often improve the circulation more than most of our drugs. "What doctor possesses such curative resources as are latent in a spark of happiness or a single ray of hope?" queried that neurotic but charming French writer, Amiel. Pope wrote beautifully of hope springing eternally in the human breast, but we doctors know that sometimes it burns very low and yet can by a cheerful environment be fanned into flame again, and with it comes improvement. Often we must be present at a bedside where there seems little to look forward to, but fortunately, nature generally throws a cloud over the sufferer's senses and he does not look far ahead, and if we can encourage the hope of say a better night or the near lessening of the distress we may do good, and leave the further future to take care of itself. Sometimes we do well even to encourage a bastard hope, to quote from the *Merchant of Venice.*

As long as the circulatory apparatus is acting normally, stimulants are unnecessary and, indeed, have very little effect if given. The heart here can sometimes be slowed by digitalis and can always be quickened by atropine but these changes produce no improvement in the individual because no improvement is possible where already conditions are good. It is otherwise when the circulation is not normal. In other words, the clinical effects of drugs are very different from the pharmacological ones. For example, if the temperature be normal few drugs will lower it, but when raised it is easily so affected. When the heart is beating very fast, as in many cases of auricular fibrillation, digitalis very promptly slows it yet this drug has very little slowing effect when the rate is normal. Many drugs only act as diuretics when there is œdema present, and so on. Pharmacological experiments with drugs are chiefly done upon more or less normal organs and tissues, and that usually of the lower animals, and it is a long step from these to the reactions in diseased human beings. A drug may have an effect pharmacologically, which is not present when it is given in disease, and, on the other hand, it may have no effect pharmacologically when it is active in disease. It is very difficult to demonstrate any action of expectorants in normal animals or, indeed, in healthy human beings, but when given in a case of acute dry bronchitis we soon see how well these act and bring relief. "As a matter of fact", to quote from Meyer and Gottlieb[3], "it is the outspoken or quietly cherished opinion of many physicians that the effects of drugs in human patients can in no way be reconciled with those observed in animal experiments, and that the latter are, generally speaking, of no value for practical therapeutics, in which experience at the bedside should be the sole guide of the physician." This is true to a certain extent, but, to take an illustration from another department, where would modern agriculture be without scientific and often laboratory investigation? The truth is, both bedside work and laboratory investigation are equally necessary and should go hand in hand. They are in no way rivals, but constitute a team and both are required if we hope for advance. The best therapeutist is he who, having a good knowledge of what is doing in pharmacology, cautiously incorporates in his work the results that are there obtained.

It is needless to say that when an individual shows signs of a failing circulation he must be kept at rest. This is only comparative rest, for we can never completely rest the circulation, but it may of itself be sufficient, and much of the good results often attributed to drug therapy is really due to it. A patient comes to his doctor showing signs of cardiac failure. He is given a bottle of medicine, probably containing digitalis, and is told to stay in bed. In a few days he is much better and both he and his medical attendant sometimes ascribe all the improvement to the medicine, when most of it was due to the rest. But all patients do not improve from rest alone and then stimulants have their place. I do not for a moment mean that in a case of failing heart we should rely upon rest and only use stimulants when this fails. They must both be employed only we should always remember in interpreting the results that two factors have been at work.

A failing circulation shows itself in various ways and the treatment must vary accordingly. In one instance the symptoms are dizziness and even syncope and are due to underfilling of the arteries. In another there is cyanosis, with venous engorgement of all the organs, and the arterial pressure may be normal or even raised. Again, there may be œdema, with or without cyanosis. In all there is dyspnœa on exertion or even while at rest.

In syncopal cases the diffusible stimulants are specially indicated. These are chiefly alcohol, ether, and ammonia.

Alcohol. Few drugs have been so much written about as alcohol, and battles have been waged on the question of whether or not it is a stimulant or a depressant. To my mind such discussions are academic and beside the mark. When experts differ the man in the street is often the best judge, and in his mind there is no doubt about the value of alcohol as a stimulant, and the accumulated experience of mankind is that when anyone is in a state of depression or collapse it is well to give him a drink containing alcohol The man in the street does not know or care how the drug acts, but he does know that it tends to improve such an individual's condition. The normal person needs no alcohol although he may desire it as a beverage, but when he is ill it often helps him. The effects of alcohol on the circulation are very complicated but the following are pretty well recognised. When taken in concentrated form by the mouth it reflexly stimulates the heart through the sympathetic nerves, and also reflexly increases vasomotor tone, and hence slightly raises the blood pressure. When administered well diluted these effects do not occur. After absorption alcohol slightly depresses the vagus and hence the heart tends to go a little faster, but it also acts as a food to the heart muscle (alcohol having a caloric value of about seven calories to the cubic centimetre) and this latter effect is of great value when the nutrition is low, as in prolonged fevers, for alcohol requires no digestion but is directly absorbed and then burnt up. The result is that in weakened conditions, such as typhoid fever, the heart may be so improved that it beats more slowly but with greater force. In such cases it indeed maketh glad the heart of man. I think that Lauder Brunton's directions for the use of alcohol in disease were excellent. He wrote:[4] "The rule for the administration of alcohol is a very simple one. It is to sit by the side of your patient for a while and watch him after the administration of a dose of alcohol, and if you find that the alcohol brings back the various functions nearer to the normal then it is doing good; if the functions diverge further from the normal after the administration of alcohol then it is doing harm. I use this means of expressing the action of alcohol advisedly, because if we take the different functions we find that a special rule will not include them all. Thus, the pulse may become quicker or slower after the action of alcohol, and yet the question of whether good or harm has been done depends upon the condition of the pulse beforehand; that is to say, if the pulse has been abnormally slow, and it is quickened by alcohol, it is doing good, for it has brought the pulse nearer to the normal. On the other hand, if the pulse has been abnormally quick, and is slowed by alcohol, it again has been brought nearer to the normal, and hence the alcohol in this case has done good......The same rule is applicable to the tongue. If the tongue was previously dry and becomes moist after alcohol, then it has done good; in the same way, if the skin were too hot and dry before we gave alcohol, and the alcohol brings it back more to the normal, makes it cooler and moister, then the alcohol is doing good. If, on the contrary, the alcohol makes the skin drier and hotter in fever, then it is doing harm. But if the skin were cold and bedewed with sweat in collapse, and alcohol makes it warmer and drier, it is again doing good."

One might paraphrase these sound views by saying that in depressed conditions the drug should be cautiously tried, always watching the effects closely, and if the patient improve then continue it for a time, but if he does not do so stop it.

Ether is often of use in cases of failing circulation. Pharmacologically its effects are slight, but in conditions of collapse the stimulating influence is undoubted. Martindale and Westcott say, "It saves many lives threatened with syncope, collapse, and shock from hæmorrhage or injury." For these purposes it is best given hypodermically, a syringe full at a time but in milder cases it may be given by the mouth as Hoffman's anodyne. Ether is an intoxicant and when Father Matthew put down the use of alcoholic liquors in a large part of Ireland many people took to ether instead.

Ammonia when inhaled or taken by the mouth acts reflexly and hence the common use of smelling salts and of sal volatile in syncope. The drug is much used in the tropics in cases of snake bite, largely replacing alcohol for this condition. When ammonia is given hypodermically or intravenously it raises the blood pressure and directly stimulates the heart muscle, and, as Cushny says, "may be sufficient to tide a patient over an acute collapse."

Strychnine is perhaps at present the most commonly used stimulant in cases of collapse. There is no doubt about its value as a general tonic, but in emergencies it is disappointing and has little effect upon the heart rate or blood pressure. I think, all the same, that Sir James Mackenzie was a little too sweeping when he wrote that "there is not a single observation, clinical or experimental, of the slightest value to show that strychnine in medicinal cases has any effect upon the heart or blood vessels."

Caffeine has been overestimated as a circulatory stimulant. It has a slight action upon the heart, at first slowing it through the vagus and later hastening it through direct action upon the muscle. The strength of the systole is thus slightly increased, but the blood pressure is little affected as there is a vaso-dilatation which counteracts the effect of the increased heart action. The chief action of caffeine is on the central nervous system, and in cases of dropsy on the kidneys. In the latter instance it is often extremely useful in enhancing the diuretic action of digitalis.

Adrenalin and *Pituitrin* both raise the arterial blood pressure and are of use in emergencies when this is seriously low. As is well known, they bring about this effect in quite different ways, the pituitrin acting directly upon the muscular coat of the vessels while the adrenalin exerts its effects through the myoneural junctions of the sympathetic. I prefer pituitrin and have often found it of great use in pneumonia when the blood pressure is very low. Pituitrin has little direct effect upon the heart, adrenalin has a complicated one owing to two factors. At first it hastens it by stimulating the sympathetic, next slows it through the rise in arterial blood pressure, and finally hastens it again as the vagus tires and the sympathetic action once more predominates. Both of these drugs only act very slightly when given hypodermically, more when used intramuscularly, and very actively when given intravenously.

Camphor is a drug which has very little effect upon the normal circulation, but there is much clinical evidence that in infective conditions, such as pneumonia, its action is more evident. Given intramuscularly or even intravenously in olive oil it is greatly used in this condition, especially in Germany.

Atropine acts purely by releasing the heart from vagal control, so that it beats more rapidly. Vaso-dilation also occurs so that the blood pressure tends to fall in spite of the hastened heart. It is a powerful stimulant of the respiratory centre which action is often useful when the circulation tends to fail. Its special indication is in heart failure with œdema of the lungs, where it will sometimes temporarily save life.

So far we have been considering the stimulants of use in emergencies, the diffusible ones being the quickest and best in sudden cases and the others when the circulation tends to fail in infections, such as pneumonia and typhoid fever. Many would put digitalis in the latter group and there is some evidence that it is of value in pneumonia, but it is not of a very strong kind, and personally I do not think that digitalis would be much missed if it were never used in acute conditions. But when the heart tends to fail in chronic conditions it is to the digitalis group of drugs, and especially to digitalis itself, that we can turn with great confidence. Much has been written as to the proper kind of case for the use of digitalis, but I think that one can summarize the matter in a single paragraph.—The drug is indicated in all afebrile cases of heart failure accompanied by œdema, and here it seldom fails to give relief; in cases where there is cyanosis without œdema it is of some value; in fast regular hearts without evidence of heart failure it is of little use.

Of recent years, chiefly due to the Mackenzie school, it has been taught that digitalis was specially indicated in auricular fibrillation, and, indeed, many have gone so far as to say that it was only here that it was of any great value. But much evidence has lately been accumulating that it also acts well when the heart is regular. The fact is that about 70% of the heart cases that come to hospital with symptoms of failure have auricular fibrillation, but it is not the fibrillation that calls for digitalis but the ventricular failure. A fibrillating heart may not need digitalis if the ventricles are acting well in spite of the handicap, and, on the other hand, a heart with normal rhythm may require the drug very much. Digitalis has no effect upon the fibrillating auricles, in fact, it will sometimes produce fibrillation if given freely enough. In a paper given at the meeting of the Association of American Physicians last May, Dr. Christian, of Harvard, pointed out that, taking the three criteria of benefit from digitalis as being loss of weight from the lessening œdema, diuresis, and slowing of the heart, cases with normal rhythm did just as well as those showing fibrillation; and in the discussion that followed, Dr. H. A. Hare went so far as to say that he thought that the drug was more useful in failing compensation where the rhythm was regular than where fibrillation existed. I would not go to this length but would like to urge that digitalis should be used in all cases of heart failure, especially those showing œdema, whether the rhythm be regular or irregular and whatever the lesion.

When digitalis fails to produce its expected results—of lowering in weight, diuresis and slowing of the heart rate—the explanation is generally one of the following: (1) the wrong kind of case; (2) defective quality of the drug used; (3) insufficient dosage.

As already said, digitalis is of little use in acute conditions or in fast regular hearts without œdema. When œdema is due to kidney involvement or other extracardiac cause the drug will have little effect.

The quality of digitalis varies greatly, some samples being of full or even excessive strength while others are nearly inert. This has been pointed out in recent years by many workers. Only the other day Moffat and Lewis, of Montreal[5] found that of many samples of tincture tested on cats 78% were below strength, and the infusions were even worse. Hence, the importance of only using digitalis from reliable firms.

As regards the dosage, even when we know that the drug is good, the amount suggested in the pharmacopœias is usually insufficient. The dose of the tincture given in the *British Pharmacopœia* is 5-15 mins, in the *American* 7½ mins. and in the *German* as maximum 1.5 grammes. Nowadays in an average case the usual amount given is from one to two drachms in the twenty-four hours. Or, we can employ what is called the massive method, where the total quantity probably required is given in one day. This is .15 c.c. for each pound of the body weight, so that a patient weighing 150 lb gets about 22.5 c.c. in twenty-four hours, or about 5½ drs. This massive method is still on its trial and seems to work well in hospital where the patient is under constant observation, but as a rule the more gradual way is advisable and the results are just as good although they take longer to appear. Some patients need much more of the drug than others before they show the effects, and the rule should be to give say 20 to 30 mins. three times daily until the heart rate is reduced to about 70 per minute or until any untoward effects appear. These are chiefly gastric disturbance, scanty urine replacing the diuresis or coupled heart beats. As long as none of the unwished-for effects occur the drug can be continued even although we have already far exceeded what many can take. Idiocyncrasy in regard to digitalis is very great.

Time will not permit of any discussion of the many different preparations of digitalis, but the effects can usually be equally obtained from the tincture, the infusion or the powdered leaf.

In urgent cases of failure strophanthin is valuable and may be given intramuscularly or even intravenously. The dose is generally given as 1/100 gr. but the drug is a very edged tool and I would advise the use of not more than half this amount, which, if necessary, may be repeated in a few hours.

Such are a few disjointed thoughts on the use of stimulants in the treatment of the sick. Often they fail us because the muscular tissues of the circulatory apparatus are too much damaged to respond to the call, but in most instances we can lessen distress by improving the blood flow, and in some cases may even make the difference between life and death.

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FUNCTIONAL PARAPLEGIA (WITH CASE REPORT)

KENNETH A. MACKENZIE, M.D.,

Halifax

As a representative of that large and interesting group of nervous disorders which we regard as functional in nature, Paraplegia has more than an ordinary claim on our attention. In the first place it is one of the easiest neuroses to cure and lends itself particularly well to the elucidation of the principles on which psychotherapy is based. In the second place it is not always recognized as such and cases have passed through the hands of eminent physicians who have either failed to recognize its nature or if they have recognized it, have failed to bring about a cure.

In the spring of 1918 I arrived at the Seale Hayne Neurological War Hospital on the same day as a patient who had not walked for three years. He was a bright, intelligent man of thirty years, well nourished and healthy in appearance. For eighteen months he had been a patient in various military hospitals in England. It is hardly probable that this patient could have remained this long in hospital without having the skilled advice of some eminent British clinicians. I do not know whether they recognized the functional nature of the case or not, but I do know that they failed to cure him and that he was discharged to pensions with 100% disability. Eighteen months later, that is three years from date of origin, he was taken from his home to Seale Hayne and a few days later I saw him running around the square like a school-boy. His cure had been effected by psychotherapeutic measures.

A few days later I saw another patient who was brought to hospital on a stretcher. Two years previously he had a fracture dislocation of the vertebrae. This was followed by a laminectomy which left a depression in his back large enough to hold a small saucer. He had not made any attempt to walk since the accident. As there was definite evidence of organic damage to the cord, such as the presence of Babinski's reflex and ankle clonus, there was a good excuse for looking upon this case as an organic and permanent paraplegia The neurologists at Seale Hayne, however, assumed that there might be a functional element in the case, and their efforts were rewarded a few days later by seeing the man walk several miles with the aid of a walking stick.

This was a case in which a minor part of the disability was organic and permanent, but in which the major part was functional and curable. I cite these cases to show you that it is not only the busy general practitioner who may fail to recognize and cure such cases, but that the same thing happens to men of wider and more mature experience.

In the third place functional paraplegia has played such an important rôle in the history of quackery that this phase of the subject has more than ordinary interest. There is hardly an irregular sect or system of cure which has not received an undeserved amount of credit because they have made a paraplegic walk. Two years ago a girl who had not walked for four years made the pilgrimage to St. Anne de Beaupre and there threw away her crutches. A miracle was announced. The records of religious shrines have in all ages supplied evidence of cures of similar nature. St. Anne de Beaupre and Lourdes have scores of cases to their credit. Similar cases fall into the hands of chiropractors, osteopaths, Christian scientists and other less widely known healing cults. A marvellous cure is heralded far and wide, and becomes an effective advertisement for the particular treatment; another failure is credited to the medical profession and thousands of people are persuaded to seek help at these false fountains of healing. Many of them are relieved of their money if not of their malady, and so the game has been going on since the beginning of history.

I might also cite the case recorded in the fifth chapter of St. John of the cripple who, being a paraplegic for thirty years, was commanded to take up his bed and walk. He did so and it states distinctly that his cure was the result of his great faith. It is not too much to say that this was a case of functional paraplegia, but I am not unmindful that I am on dangerous ground when I attempt to remove this case from the realm of the miraculous. I can defend my position, however, by saying that the laws of nature would never be broken by Divine intervention if the desired effect could be produced by the operation of natural law.

Having made a feeble attempt to emphasize the importance of my subject, I make no apology for reporting a case which I was fortunate enough to meet, treat and cure in 1919. I realize that there is nothing remarkable in this case from the point of view of the neurologist. However, it may serve to focus attention on certain principles of therapy which are not as widely appreciated as they should be.

The case referred to is a lady, now forty years of age. She was thirty-eight years old at time of treatment, and for seventeen years, had been a complete invalid. As the result of a few weeks treatment by psychotherapy, she was restored to a normal state of health and for the past two years has been leading a normal life in her home. The history is as follows:

Until the age of twenty-one, she had no illness of any importance, but she was looked upon as delicate, and any minor illness was a pretext for unusual solicitude and over zealous attention on the part of her parents. She attended school, played games and took a normal interest in her work both at home and at school; I was informed that her school work was above the average. After completing her High School work, she attended the provincial Normal School in order to qualify for the teaching profession. In 1901 she was employed as a teacher in a rural community in Nova Scotia. In 1902 she had some difficulties with the school trustees and was obliged to give up her charge. She returned home in the middle of the school session and was treated by her physician for a "nervous breakdown." She was kept in bed for two weeks and then rested at home and later at the seaside for several months. The symptoms which she recalls as having had at that time were general weakness, heavy sensation in feet, numbness of limbs, sleeplessness, anorexia and palpitation. In September, 1902, she had typhoid fever. She was febrile for three weeks and during convalescence she had a relapse. She apparently recovered but found that she was unable to move arms or legs. This was the beginning of a paraplegia which lasted for seventeen years.

At first the condition was looked upon as one of typhoid spine. In later years the attending physician looked upon it as a functional disability, but his therapeutic resources failed to effect a cure. There is no doubt that the sympathetic interference of relatives was a factor in defeating the attempts of the attending physician to bring about a cure. During the seventeen years which followed, changes were of a minor character and in the direction of improvement. In the second year, for example, the muscles of the hands and forearms became relaxed and normal and she was able to feed herself, paint china, crochet and do fancy work. She spent many months in the local Hospital and in 1905 returned to her home and accepted her state as one of permanent invalidism. This was also accepted by her friends. In 1912 a further attempt was made to treat her and she spent thirteen months in the Victoria General Hospital, Halifax, where she received her full share of drugs, massage, electricity, thermocautery, etc. the usual programme for hysterical patients. Her condition did not change in any respect, and she returned to her home in the same condition as on admission.

During these years at home, she neither walked, nor attempted to walk, nor did she even lift her head from the pillow. She was tenderly cared for by her friends. Every morning she was lifted from her bed and placed on an invalid chair where she spent the day, and at night she was carefully lifted back to her bed. In early spring she was wheeled out on a verandah, which faced the main street of the town, and was the daily object of sympathy and pity to passers by throughout the warm season. And thus it happened that for many years she shared honours with the robins and the mayflowers as the harbingers of spring. Her daily life, however, was not idle; she painted, sewed, crocheted and read all kinds of good literature. Through the kindness of friends she accumulated a very respectable library. She kept up a very interesting correspondence with many friends and her letters were neatly written and full of humour. Through the kindness of friends she had installed in her bedroom, a telephone, the other end of which was placed in front of a methodist pulpit and she was thus enabled to be a constant though hidden member of every service.

I knew this patient when she was a girl at school and was fairly familiar with her history although I had not seen her professionally. On my return from overseas I made a special point of seeing her. My first inquiry from friends brought the reply that she was still living but that she was very feeble and that the end was very near. On examination I found her pale and sallow, with an anxious expression. All the muscles except those of the hands and forearms were spastic. The legs could not be bent at the knees or hips. The muscles of the neck also were spastic and prevented the head from moving freely in any direction. When she wished to turn her head, she would ask for help and it was quite plain that the inability to move the head was due to spasticity of opposing muscles and not to paralysis. There was a hyperæsthesia and hyperalgesia of the skin all over body and an obvious fear of being hurt. There were no anæsthetic areas. The deep reflexes were all exaggerated; there were no abdominal reflexes. She complained of severe pain in back, legs and neck, *i. e.*, in the areas of spasticity. The legs were œdematous to the knee, being twice their normal size, easily pitting on pressure. There was not present a single emphatic sign of organic nervous disease. The œdema of the legs was a bit disconcerting. However, examination of heart and kidneys definitely excluded cardiac and renal disease and I concluded that œdema was due to stasis from long disuse.

Having decided that the case was functional, I announced in a very emphatic manner that her case was curable and that I hoped to have the privilege of effecting the cure. Her facial expression quickly changed from one of forlorn helplessness to that of genuine hopefulness. She stated that she often had a feeling that someone would help her and she expressed a hope that it would be me. I had her brought to Halifax on a stretcher and placed in a private hospital. Her friends expressed doubt as to her ability to stand the journey. The details of treatment may be now very briefly told. The first day was devoted to rest after the railway journey. On the second day I spent some time in describing some simple facts in connection with the anatomy and physiology of the nervous system and demonstrated to her that I knew that the various nervous paths were intact and that I was certain of a complete cure. My first seance consisted of grasping the head with my two hands, moving it from side to side and in an antero-posterior direction until the muscles were tired and were felt to relax. I then asked her to make the effort herself, assisting her less and less until I felt that she was performing the movements herself. I then said sharply to her, "Now you can move your head, you have already done it, do it again." To her great surprise she found that she had complete control of all her head movements, the spasticity of the muscles disappeared, and what was most interesting, never became spastic again. It was the first time in seventeen years that she moved her head freely. Her delight was indescribable and the prospect of a cure was now a certainty.

On each successive day other groups were dealt with in the same successful manner. At the same time that spasm ceased, the pain also disappeared. For a time the œdema of the feet and legs threatened to defeat my efforts, but time and patience and perseverance won.

The various progress steps were as follows: On the third day she sat up in bed and in a chair without support. On the fourth day she stood on her feet at foot of bed. On the fifth day she walked across the room supported by the doctor and nurse. During the second week she walked up and down stairs except that she steadied herself by grasping the bannister. It was much easier for her to go up stairs than down. On the fourteenth day she took her first auto ride and walked to and from car with assistance of nurse. On the sixteenth day she found her balance for the first time and was able to stand alone. On the twenty-first day she got out of bed alone and walked around the room without any assistance. On the twenty-eighth day she left Hospital and went to a private home on the distinct understanding that she would do without a nurse. From then on she dressed herself, attended to her toilette, walked about the house and dined at the table. During the fifth week she took walks on the streets and in the public gardens. During the sixth and seventh weeks, she went shopping, attended church, theatres, etc. It was then, for the first time in her life, that she saw a moving picture, as there were no such things in operation when she went to bed.

At the end of seven weeks she returned to her home as an ordinary passenger stopping en route to spend a week-end with friends in a neighbouring town. You can imagine what a sensation she caused when she stepped off the train in her own town, where she was known as an invalid for seventeen years.

During the two years which have elapsed since treatment, she has been living a normal life, doing housework, shopping, attending church and theatre and calling on her friends. She has gained many pounds in weight and looks well.

The points worth emphasizing in the case are:

1. The patient was cured by psychotherapy alone. No accessory measures were employed. The first steps may be called therapeutic conversation, the object of which is to gain the confidence of the patient and prepare the soil for the reception and acceptance of suggestions. Then followed a series of requests to perform certain movements always accompanied by positive and emphatic assertions that she could do it. Finally a long round of re-educational exercises which led up to and included all the activities of a normal healthy life.
2. The patient could have been cured at any time during the seventeen years of invalidism by similar methods and on the other hand the paralysis might have continued to the end of the patient's life if left alone.
3. The clinical features were similar to the phenomena which can be produced by suggestion during the hypnotic and post-hypnotic states and in the waking state in some suggestible individuals.
4. The secondary changes such as œdema, deformity of toes, and change of postural tone in muscles interfered with the rapidity of cure. If these features had been absent, the cure in this case might have been brought about in a few days instead of a few weeks.

The principles of cure which are summed up under the name of psychotherapy have a wide range of usefulness in clinical medicine. Every physician is a psychotherapist consciously or unconsciously, but the principles can be used much more than they are. It is not even necessary to be a medical man in order to be a psychotherapist; a clergyman, layman or quack may make psychotherapeutic cures, but in doing so they are usurping the place of the properly trained physician who alone is qualified to differentiate between organic and functional disease, and thus select those cases which require psychotherapy and those who require other measures for relief.

EPIDEMIC ENCEPHALITIS—THE INFLUENCE OF HORSE SERUM IN TREATMENT—A PRELIMINARY NOTE*

Colin K. Russel, M.D.,

Lecturer on Clinical Neurology, McGill University, Montreal

If one seeks in the literature for assistance or suggestions, even, in the treatment of epidemic encephalitis, one will, I am sure, meet only disappointment. Though much has been written in the description of this disease, one must be impressed by the fact that very little has been done to help us in the treatment. One's feeling of helplessness in such cases is extreme. In my experience, the administration of hexamine has been absolutely useless, and it is very doubtful if it could be expected to accomplish anything. While I perfectly well recognize that from the small series that I have to report no definite conclusions can be drawn, it has seemed to me while these cases were under observation, that the results were definite enough to justify bringing this method of treatment to your attention. In the first case, a definite progressive and severe type, the improvements following the administration of diphtheric antitoxin were so evident as to justify its use in further cases. The second case was already of long standing before admission to the hospital, and while the results were not so striking as far as the signs of the disease were concerned, there seemed to be an ameliorating action on the temperature and the progressive character of the disease. One can imagine the destructive processes at work were already too far advanced to be affected. In the third case the results were most strikingly satisfactory. A fulminating onset with all the evidences of the hæmorrhagic type of the disease, headache, beginning choked discs and the characteristic C.S.F. with marked improvement following so definitely on the administration of the serum.

The fourth and fifth cases were evidently of the polio-encephalitic type. Both showed a definite improvement with the treatment, although the fifth case was left with a sequela in the shape of a partial anterior tibial group paralysis. In this case, considering the severity of the general symptoms one was rather relieved to get off so easily. The sixth and seventh cases were evidently fulminating cases from the beginning, and in these cases no results were obtained.

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*Read by Dr. Wm. Boyd.

After the first case it had been recognized that the antitoxin was not the active principle. Horse serum was used. Whether its action as a foreign proteid or its hemostatic qualities are most beneficial, it is impossible to say, but I would suggest both factors might come into play. The influence on the temperature would suggest the beneficial action of the foreign proteid, while the disappearance of the signs of organic disease which have already appeared and have been progressing, would suggest the possibility that the more or less minute hæmorrhages so characteristic of the disease have been controlled.

The possibility of our having met with a milder type of infection towards the waning of the epidemic must certainly be considered. At the same time, I would point out that the last two cases were of the most severe and fulminating type, and also that we were careful not to use this method of treatment in cases that were evidently improving. The usual precautions against sensitized patients were taken where indicated.

CASE I.—L. D. Female; aged 14; Russian Hebrew. Admitted, January 26th, 1921, under Dr. W. F. Hamilton. Discharged, June 17th, 1921.

Complaints.—Drowsiness and mental change. The present illness began one week ago with sore throat and stiff neck, then general malaise and drowsiness and a gradual developing stiffness of her muscles. Since yesterday she has not spoken and has taken little or no nourishment. Her personal and family history show nothing of interest.

On admission the patient appears to be semiconscious and somnolent. She can be roused to stare uncomprehendingly but does not speak. She understands what is said to her but responds to commands slowly and inadequately. However, if raised and given a paper and pencil she will write her monosyllabic answers intelligently. When told to open her mouth, or her eyes, there is very slight movement of the lips or lids. When given a drink the fluid is allowed to collect in her throat, and no effort made to swallow or expel it. There is a marked catatonic rigidity, and the limbs stay moulded in any position in which they are placed until they are passively replaced. There is rigidity of the neck, back and lower limb muscles to passive movements. The fundi are normal; the pupils are equal and active to light. The eyes stare in a forward direction but can be moved laterally with only apparently a strong effort. There is dorsal flexion of the right great toe (Babinski's phenomenon); the left is indefinite. The knee and ankle jerks are present. The abdominal and epigastric reflexes are all present. She has involuntary micturition. Lumbar puncture shows a clear fluid under a slightly increased pressure. There were forty cells to the c.m.m. practically all are lymphocytes. There is no excessive globulin. The Wassermann is negative. Examination of the nose showed a subacute rhinitis and there was also a chronic catarrhal otitis-media of the left ear. The heart, lungs and abdomen showed nothing abnormal. The urine, a catheter specimen, was acid, 1,040; a trace of albumen; no sugar; some acetone; microscopically, phosphates and many urates. Her blood count showed 7,400 white cells and 100% hæmoglobin.

Lumbar puncture was repeated on January 28th, and again on February 2nd and 6th, with practically the same findings as on the first examination, the cell counts varying between twenty and forty cells to the c.m.m. The patient appeared to be worse; was very dull mentally and more difficult to rouse. Involuntary micturition continued and the patient was put on an air bed. A greasy sort of perspiration was noticed on her face at times.

On February 7th, 1,000 units of diphtheric antitoxin was administered subcutaneously and this was repeated two days later. On February 11th, a lumbar puncture was done and the examination of the C.S.F. showed 110 cells to the c.m.m. At the same time, 1,000 units of diphtheric antitoxin were given. At this time examination of her nervous system showed a mental condition which strongly suggested negativism. If the patient were told to open her eyes she closed them, and if told to open her mouth she shut her jaws tightly. The condition of catatonia was still exhibited. The knee jerks and ankle jerks were active. There was a bilateral extensor response (Babinski) and there was a tendency to contracture of the calf muscles and ham strings. Four days after the first injection of diphtheric antitoxin, the temperature, which had been running between 99° and 101°F, came down to normal for the first time, and from then on it remained normal, with occasional slight rises, during the following three weeks. Her mental condition became brighter, and on February 17th, it was noted that she voluntarily attempted to move her limbs. On March 5th, she spoke out loud for the first time. Examination of the C.S.F. at this time showed it to have a normal cell count. The lower extremities, however, were very much contractured, and rather severe bed sores formed on the sacrum. The facies suggested very strongly the fixed rigidity characteristic of Parkinson's disease, and there was slight tremor of the hand. The voice was somewhat monotonous and suggestive of the same condition. These conditions were overcome, or cleared up, before her discharge on June 7th. The patient has continued well since. When seen a year after her discharge, there was only the slightest suspicion of a Parkinson facies. The pathological reflexes had all disappeared.

CASE NO. 2.—M. N. Female; aged 45; Irish. Admitted, March 7th, 1921, under Dr. W. F. Hamilton.

Complaints.—Nervousness, drowsiness, diplopia, loss of memory

Onset, six weeks ago with diplopia and then an inability to concentrate on any undertaking, with loss of interest and ability to care for her home. Some difficulty in articulation developed. She feels drowsy all the time. The personal and family history showed nothing of interest. There was nothing pathological in the respiratory system nor in the cardio-circulatory system save that the pulse was continuously rapid; about 110. The abdomen was negative. The urine showed nothing abnormal. Examination of the blood showed 4,700.000 red cells, and 7,200 white, and 100% hæmoglobin. B.P. 165 systolic, 100 diastolic. Examination of the nervous system showed the optic discs normal. Pupils equal and react to light and accommodation. The ocular movements are limited in outward movement in either eye. Upward movement in the right eye is limited as compared to the left. Lateral movement is accompanied by a coarse nystagmus. Upward movement also, but this is of shorter duration. There is a suspicion of relative immobility of the facial muscles. The patient states that her mind is not as clear as formerly, and since the onset of the double vision she has been very sleepy, falling asleep almost on her feet. Spinal fluid was under some increased pressure, contained 15 cells to the c.m.m. but no globulin. The Wassermann was negative in both her blood and C.S.F. The patient gradually became rather more somnolent, and the expression of her face more mask-like. The pupils on March 18th, did not react to light or accommodation, but her condition otherwise remained about the same. However, with the increase of the lethargy the spasticity of the muscles became more marked. At the same time her temperature, which had been running along just above and below normal, became generally more elevated, averaging about 100° F., so that on the 26th of March, she was given 1,000 units of diphtheritic antitoxin. This was repeated on the 28th, 10,000 units being given. Her temperature following this showed a slight decline, but the patient still remained very stuperose. On the 31st, she was noted as being less lethargic and stupid. On April 1st, she was given 20 c.c. of horse serum subcutaneously, and from then on the patient seemed to gradually progress towards recovery, although contractures, which developed in the lower extremities, retarded her getting out of bed. The pulse, too, continued to remain very rapid even after the temperature had fallen to normal, and the fact that she had had a fractured patella with some separation of the pieces, of long standing, complicated matters somewhat.

On *discharge* on August 10th, she still showed the Parkinson facies and some contractures of the ham string muscles, and the pulse was still rapid.

CASE NO. 3.—V. M. Female; age, 23 yrs; single. Was admitted to my service on September 8th, complaining of prostration, loss of memory with mental confusion, general weakness and fever, severe headache.

Onset.—The patient was perfectly well until September 2nd, 1921. On the steamer the second day out from England she had been enjoying herself dancing and going in for the games, feeling particularly well. In the morning she was found unconscious on the floor of her cabin and had evidently vomited. An overturned chair suggested that she had struck her head in falling, but there were no bruises. She remained unconscious for two days. On regaining consciousness she would answer questions in monosyllables; would not talk much unless spoken to, but then answered perfectly correctly and in a set phrase. No personal or family history of interest. Her temperature was 101° F.; her pulse was 60. Examination of the blood showed 13,200 white cells to the c.m.m. Examination of the heart, lungs, abdomen and kidneys showed nothing abnormal.

On admission, the patient was dull mentally, she had loss of memory for all events at the onset of her sickness. Her memory for other times was more accurate, but she was unable to concentrate enough to correlate things and people, and soon forgot what she was talking about. The fundi showed some slight obscurity of the optic discs suggesting the beginning of a papil-œdema. There was some rigidity of the neck, but otherwise the muscular system and sensory system and the reflexes showed no abnormality.

On lumbar puncture, 15 c.c. of clear yellowish fluid were withdrawn under slight pressure. There were 52 cells, all mononuclear or epithelial to the c.m.m. There was excessive globulin. There were no red blood cells, and evidently the yellowish colour was due to blood pigment. 10 c.c. of horse serum were administered subcutaneously on the 9th of September. The temperature gradually came down to normal and the pulse rate which was below 50 at the time of lumbar puncture gradually came up to normal, so that by the fifth day after admission, both pulse and temperature were normal, the headache had entirely disappeared and the patient made an uninterrupted convalescence. An easy mental fatiguability and a lack of power to concentrate were the only remaining symptoms. She was discharged on September 30th, apparently quite cured, and has remained well ever since.

Case No. 4.—L. M. Male; age, 10 years. Admitted to my service on November 5th, complaining of fever, night terrors, stiffness and pain in the neck. The present illness developed about one week ago. After a game of football he felt poorly for two days although he still went to school. Five days ago, however, he had to stay away from school on account of dizziness, but was able to play around the house. The next day he was worse. Had a temperature of 101°, complained of pain in the back of the neck. He was very restless at night and was haunted with terrifying dreams. For the last two days he cried most of the day, picking at the bedclothes, wakening out of any sleep in a great fright and complaining of pain and stiffness in the back of the neck and limbs.

His personal and family history presented no details of interest. Examination of the various viscera showed nothing abnormal. The cranial nerves were all normal; the muscular system showed no atrophy; power was good with no incoordination. There was rigidity of the neck and Kœrnig's sign was quite definitely positive. Sensory system showed no impairment of sensibility. The tendon jerks were all equal and active, the plantar flexion right and left. Lumbar puncture showed a clear, colourless fluid under no pressure with 55 cells to the c.m.m. all lymphocytes. There was no increased globulin. The temperature was 100° on admission; the pulse, 80. Ten c.c. of horse serum were given subcutaneously. The following day the patient's temperature had come down to normal where it remained. The rigidity of the neck disappeared but he still complained of pain in the legs and it was discovered a day or two later that he had paralysis of the anterior tibial group in the left leg affecting all the muscles of that group. For the first three days in the hospital there was noted a slight twitching of the muscles in both arms and legs especially during sleep, but this afterwards disappeared.

While one cannot say definitely that this was not a condition of acute poliomyelitis, the presence of the symptoms attributable to the brain, and the fact of the epidemic of encephalitis suggested that infection rather than a diagnosis of poliomyelitis. The condition was looked upon as of the nature of an epidemic polio-encephalitis. The paralysis of the anterior tibial group has cleared up partially under electrical treatment.

Case No. 5.—M. G. Male; aged 12; Hebrew. Admitted to Dr. Martin's service, August 13th, 1921, complaining of weakness of the legs, arms and hands and difficulty in walking. His present illness began on July 31st, when he complained of a headache, general malaise and a chilly sensation. The next day he had no appetite and vomited and was put to bed where he remained all that week with the same symptoms. Insomnia later developed. During the next week he felt loss of power in his legs and arms and when he got out of bed on August 11th, he was unable to walk without staggering. His mother noticed a slight drooping of the left eyelid for the past week, but there was no complaint of double vision. Apart from this extreme weakness in the arms and legs the patient felt better on admission than he had previously. His temperature was 99-1/5th, the pulse, 110, respiration, 23.

His personal and family history showed nothing of interest. Examination of the various viscera showed nothing abnormal. Examination of the nervous system showed fundi normal, pupils react to light with a slight drooping of the left eyelid but ocular movements were otherwise normal. The left eyelid does not move up to quite the same extent as the right. The cranial nerves are otherwise normal. The muscular system showed no atrophy. There was, however, definite loss of tone in all the muscles in both upper and lower extremities, with great weakness but no definite paralysis of any movement. There was no sensory loss to be observed anywhere. The tendon jerks in both upper and lower extremities were not obtained; the plantars were flexion right and left; the abdominal and epigastric reflexes were present; there was no loss of control of the sphincters. Examination of the blood showed 4,250,000 red cells, 18.000 leucocytes, 80% hæmoglobin.

The weakness of the extremities became progressively worse; a bilateral wrist-drop developing after exertion. Three injections of 10 c.c. of horse serum were administered subcutaneously on the 19th, 21st, and 25th. This was followed by a gradual improvement in the strength of the extremities, so that by September 7th he was able to stand and walk, and by the 21st he was rapidly gaining in muscular power and could walk about the ward quite well. He was discharged on September 30th. A week later, however, he was re-admitted owing to a recurrence of the muscular weakness following exertion on his return home. Rest in bed and massage, however, quickly brought about a recovery of power and he was discharged completely well two weeks later.

Case No. 6.—A. E. Male; aged 42; married. Was admitted under Dr. A. T. Henderson on November 23rd, 1921.

Complaints.—Headache, stiff neck, double vision.

Present illness.—For the past week the patient has been tired and restless and has not been sleeping well. Five days ago he felt worse and stayed in bed all day. He complained of drowsiness. The next day he developed some pain in the back of the neck. On November 21st the patient went to his office although complaining of severe occipital headache. He managed, however, to work the whole day. On November 22nd he was seized with sudden forcible vomiting. The vomitus consisted of greenish liquid. The vomiting was continued six times on the day of admission. The headache was most severe. The gait has been staggering on any attempt to walk in the last two days, and he sees double. The heart, lungs and abdomen showed nothing pathological, and the urine was not abnormal. Examination of the nervous system showed a restless irritability and he was very difficult to examine. Fundi normal; pupils equal and react to light and accommodation. He has diplopia for near and distant objects. A coarse lateral nystagmus on looking to either side. Marked photophobia. Some dysarthria. The patient seems sleepy and yawns a great deal.

Muscular system showed normal tone; the power good. No wasting. There is considerable incoordination in the right arm and leg, finger-nose and knee-heel test. No loss of sensation could be made out, and no loss of sense of position. Tendon reflexes were all equal and active; the plantars flexion right and left. Abdominal reflexes equal and active on both sides. Lumbar puncture gave a clear fluid withdrawn under some pressure. Showed 20 cells per c.m.m.; all lymphocytes; no increased globulin. His temperature on admission was 99-2/3; pulse 72. Ten c.c. of horse serum were administered subcutaneously. He became more drowsy and difficult to rouse and had to be catheterized. Suddenly, on the day after admission he became very cyanosed, choked up with mucous, and died. No autopsy was permitted.

Case No. 7.—A. S. Male; aged 65. Admitted to my service on March 16th. Died March 22nd, 1922.

Complaints.—Paralysis of the upper and lower extremities. Some mental confusion at times.

Present Illness.—Began ten days ago with severe cold in the head and chest, associated with fever. The bowels were constipated. He was confined to bed. Four days prior to admission he complained of some soreness in the muscles of the upper and lower extremities with definite weakness in the right arm. The condition gradually increased and two days prior to admission he became definitely paralysed in both lower extremities; both upper extremities were also severely affected. Constipation still persisted and no movement of the bowel could be obtained in spite of cathartics. Mentally the patient was somewhat confused and disoriented, extremely restless and irritable. There is nothing in the personal family history bearing on his present condition.

Present Condition.—The patient is a poorly nourished elderly man, mucous membranes pale, with a general appearance of being seriously ill. Examination of the ears, nose and throat was negative. No enlargement of the lymphatic glands. Pulse 80; regular in rhythm and volume.

Vessel walls tortuous and palpable. The heart showed no enlargement and there were no adventitious sounds; the chest was rather emphysematous in type. There is relative depression in the right subclavicular area. Very little expansion of the chest anywhere. The breathing was practically altogether abdominal. Some relative dulness over the apex anteriorly with a suspicion of blowing breathing over this area. The fundi are normal; the pupils equal, reacting sluggishly to light, probably due to the effects of morphia. The other cranial nerves showed nothing abnormal. The skin everywhere is loose and flabby, suggesting that there has been considerable loss of weight. The muscles are also generally flabby. There is definite weakness in both deltoids, triceps and biceps more marked on the right side than on the left. The forearm and hand muscles on both sides show very definite weakness, although there is no absolute paralysis in any muscle. There is no definite incoordination or involuntary movement. The muscles of the lower extremities show a similar condition. No impairment of sensibility could be made out. The tendon jerks of both the upper and lower extremities were not obtained. Plantar responses were flexion in both sides. The abdominal and epigastric reflexes were not obtained.

The urine had a specific gravity of 10.19; it was alkaline; there was no sugar and no albumen; there was incontinence. Examination of the C.S.F. showed a normal count; 3 cells to the c.m.m. pressure was not increased; globulin was present.

The day following admission showed a gradual increase in weakness of the affected muscles. Articulation became indistinct. The patient was very irrational. Did not recognize anybody. Neither enemata nor cathartics nor pituitrin were effective in overcoming the constipation. He received 10 c.c. of horse serum on the day following admission, and again three days later, with no appreciable results, as the patient died six days after admission.

Autopsy showed microscopically a very marked œdema of the brain and cord, with extreme and extensive softening of the cord. On one section of the brain, microscopically, it showed marked congestion of the vessels, and what appeared to be small petechial hæmorrhages.

Microscopic examination of this case was not completed.

The Atonic Abdominal Wall.—The attention of Chesney Ramage, Fairmount, W. Va., was directed to this condition by a large number of strong, healthy coal miners who complained of all known ills and had in common an atonic abdominal wall. The symptoms, as a rule, are general abdominal discomfort, headache, discomfort after meals, constipation and abdominal pain after lying down, relieved toward morning. There is absence of anorexia, abdominal tenderness on palpation, leukocytosis, fever, anemia and impotence. Physical examination constantly revealed good general nutrition, extreme bulging of the lower half of the abdomen, and remarkably poor tone to the rectus muscles of the abdomen. This was made especially noticeable in men who were muscled like Hercules, men engaged in the most arduous toil whose deltoids were huge blocky masses, and whose backs and thighs were hard and corded. The question arose as to why this group of abdominal muscles should be so attenuated. Lack of use, and therefore lack of tone to the muscle from some intra-abdominal condition apparently was the cause. The most reasonable working hypothesis appeared to be that there was a voluntary inhibition of the abdominal musculature on account of the pain of their pull on a broken rib to which they were attached, or during the period of acute abdominal pain when their relaxation gave relief to the patient. As long as the local condition causing the relaxation existed, naturally, the inhibition to the nerves controlling these muscles would continue. Ramage has depended for a cure almost entirely on exercises tending to develop the abdominal muscles. The best exercise appeared to be to lie supine on the floor and rise to a sitting posture without the use of the hands. This was to be practiced assiduously morning and evening to the limit of the patient's endurance. The results are surprising.—*Jour. Amer. Med. Assoc.*, June 17th, 1922.

MEDICAL ORGANIZATION*

T. C. Routley, M.B.

Secretary, Ontario Medical Association;
Associate Secretary, Canadian Medical Association, Toronto.

IT is sometimes said that the physician is a barnacle on the ship of society because he does not add to the production of the community. This statement is not founded upon truth. As a matter of fact, the physician is one of the greatest producers in his individual locality. This may be proved by the following statements—The average wage-earner is worth to the state between $3,000.00 and $4,000.00 a year. In a group of 1,000 people (the average number of a physician's clientele) it is reasonable to estimate that 200 will be wage-earners and as such (applying our minimum figures) are worth to the state $600,000.00 per year. It is not at all out of the way to estimate that the efficiency of the country's producers is kept at least at a 10% higher level by the medical profession than would obtain were the profession not functioning. Accepting this hypothesis, the average physician is shown to be a producer to the extent of $60,000.00 per year in his community. This estimate, moreover, does not include the value of the lives he may save or the protection he renders the potential producers who pass through his hands. The physician is not only the keeper of the health, and therein much of the happiness of his patients, but from an economic point of view he is one of the country's most valuable assets.

For reasons best known to themselves there are a great many individuals who would like to enjoy a place in the community on a plane with practitioners of medicine, but it is doubtful how altruistic are their aims or objects considering their qualifying requirements. The prospectus of the Canadian Chiropractic College, an Institution which recently sought legislation from the Ontario Government, presents the following illuminating information in reference to the requirements demanded of its students and graduates:

"Our educational requirements of entrance are not exclusive nor yet exigent; TO BE ABLE TO READ AND WRITE IS ALL THAT IS NEEDED. We consider that one is better qualified to learn and practice chiropractic if he is able to drive a screw or tighten a bolt. We know that neither M.D.'s nor Osteopaths are as well fitted to take chiropractic as those without their previous studies, as the latter have no medical cobwebs to be removed from their mental capacity. Our examinations must be passed with at least a minimum of 75%. Though they are apparently stringent, all can pass them successfully under our careful instructions."

"Chiropractic is the safety valve for the middle-aged worker of every class. When one's productive ability begins to wane, before that time, and even after, look for a new vocation. No matter what your employment has been break away from the tingle of the alarm clock. Chiropractic offers you the best opportunity of getting your nose away from the grindstone. Take up chiropractic and secure your haven."

"The daily compulsory attendance at the College is from 9.30 a.m. to 12 noon, five days in the week for the first six months, and attendance during the last six months from 6 p.m. to 8 p.m."

From the foregoing it will be observed that this wonderful course, extending over a period of approximately 600 hours, makes it possible for the most illiterate (young or old) to become a "Doctor" in seventy-five days (of eight hours each) and be put on a plane of professional equality with practitioners of medicine, who have spent many years to qualify.

Sometimes our profession is prone to say that it is beneath our dignity to take any steps to expose such fraud or in any manner bring the facts before the public. Possibly too, we have feared that our objects in so doing would be misconstrued, the public charging us with selfishness and with an endeavour to protect our own interests. However, when we calmly consider what a menace to humanity such ignorant charlatans and parasites are, public duty demands that we openly express our condemnation and disapproval of the exploitation of our fellow men. There is no other class in the community either sufficiently qualified or interested to bring the facts before the public. The onus obviously and most seriously rests upon us.

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*An address to the Medical Society of Nova Scotia, Sydney, N.S., July 6th, 1922.

What is wrong with the world to-day? In every land there appears to be considerable restiveness and unsteadiness which can only be attributed to one cause, *viz.*, the state of mind of the universe. The natural resources of the world, our wheat fields, our mighty forests, our minerals and our fisheries, are still with us, but there is undoubtedly an impairment, temporary we hope, in the mental outlook and balance of the people. The medical profession has a great opportunity to assist in the regaining of such mental equilibrium. Our individual and united forces can be far more reaching than the most sanguine of us could estimate. It behooves us to so unite that we may do our full share in this biggest of tasks, the getting back of our people to a calmer and saner outlook on life. To accomplish the greatest amount of usefulness in the community the medical profession must be organized.

Organization

The keystone of medical organization is the local unit or the County Medical Society. The practitioners of every locality must be organized into active units. When 100% of the medical profession of this province, and all provinces of the Dominion, realise their responsibilities and, furthermore, their privileges, there is practically nothing which we cannot achieve in the highest interests of our noble art. To none in the community is given the influential position enjoyed by the family physician. When united in their counsels, physicians can wield a great influence on public opinion. I cannot too strongly urge upon you not only the advisability but the duty of your carrying on most unremittingly until your organization has obtained the membership of every eligible practitioner in the province.

To obtain members is possibly the easiest part of the task. To hold members requires a fulfilment on your part as an organization:—to render service of sufficient character to prove to your members that the advantages both tangible and intangible in a Provincial Medical Association demand their continued allegiance.

One practitioner in discussing this matter was led into the position of stating that during the last year he had paid out $175.00 for protection in accident, health and automobile insurance. During the year he had lost no time through sickness or accident nor had he any mishap with his car. When asked the question had he not wasted his $175.00 his answer was a decided "No, during that period of twelve months I have had protection well worth the investment." A medical society cannot obligate itself as an insurance company, but when the rank and file of practitioners fully recognise that their prestige, their dignity and their professional standing can be protected by an organization of themselves our problem of completely organizing the medical profession will be solved. The investment of $10.00, $15.00, or $25.00 as the case may be, will appeal to the thinking man quite as logically as his accident or motor insurance. In this argument service and sentiment are entirely ignored; plain, selfish reasons are advanced. The other side of the picture, the one which really counts, is the power for service which can be employed by an organization to effect results for the profession as a whole and for the individual members in particular. Surely in this we have a dual appeal; sound business, and high sentiment, reaching out, requesting and urging all practitioners to come in.

Propaganda

The work of a medical association naturally divides itself into two phases, *viz.*, within the profession and without. There is much room for criticism in our treatment of the public. We have failed to take them into our confidence. There should be no air of mystery surrounding our profession, nor in truth is there such, but the great bulk of the public has felt, and still feels, that we have many secrets locked up in our hearts which we consider better that they should not know. This must be dissipated. Let us put ourselves fairly, frankly and honestly on record. The newspapers and periodicals can and will gladly help us providing we give them the right kind of material. Give the press facts, not fancies nor fallacies, and in time public confidence will be inspired and our efforts truly appreciated.

County Society Meetings

The local units should be urged to meet regularly; frequent meetings maintain and increase interest. There are doubtless many practitioners and teachers in this province who would be willing to give of their time and talent to their fellows by way of post-graduate lectures. To all such an opportunity should be given; a schedule should be completed and the county societies encouraged to cooperate. This is a tangible illustration of giving the member something for his money.

In the Province of Ontario during the past year 230 such lectures were given. The Ontario Medical Association was greatly assisted in this work by the Ontario Division of the Canadian Red Cross to the extent of a munificent grant of $5,000.00. The gift has been repeated for this coming year. It must be obvious to all that the worth and value of this type of work cannot be over-estimated while the benefits to be reflected on the general public have apparently been appreciated by a lay organization whose help has so generously and freely been given. These county society meetings and post-graduate lectures not only keep the practitioners abreast of the times, but they make for a greater spirit of harmony amongst the profession.

District Meetings

It is almost impossible for a large proportion of medical practitioners to attend the annual provincial meetings. As a matter of fact, an attendance of 20% to 25% is a fair average. It is well then to consider the advisability of holding one or two-day meetings during the year in different parts of the province, several counties meeting together in the form of a district association. Ten such district associations have been established in the province of Ontario. Last year most successful meetings were held in nine out of the ten giving many an opportunity to be present who could not get away to the larger annual provincial meeting. No doubt in the province of Nova Scotia similar distribution of territory can be worked out thereby creating and stimulating keener interest in the work of the Association as a whole.

Tariff

It was found in the province of Ontario that the tariff varied considerably, practitioners in one county working for 10% to 20% less than practitioners in another county. This information was carefully tabulated and a strong committee appointed to review the matter and bring in recommendations. The result has been that a uniform basic tariff for the province has been adopted, which will no doubt work out to the mutual advantage of practitioners and public. If you have not made a provincial study of your tariff I would strongly advise your doing so.

Legislation

If cults and pathies innumerable and sundry continue to gain a foothold in this country, one of two reasons must be admitted; either that a credulous public is being mulcted and deceived or the medical profession is failing to render proper service. If the former is true the fault is ours, while if the latter should be the case, the greater condemnation is upon us. The Chiropractors of Ontario applied for a Bill of Incorporation at the last Session of the Provincial Legislature. The Ontario Medical Association realising its duty told not only the members of the Legislature, but the public, the menace which was lurking on the horizon, and the great dangers which would follow granting any legalised standing to Chiropraxy. The Chiropractic Bill was thrown out by the unanimous vote, so far as could be ascertained, of the Private Bills Committee representing eighty-five members out of the 110 in the House. We are not at all sure that had we as a profession failed to do our duty, the result would have been such as here stated.

Dominion Organization

Some few months ago it was discovered that the Dominion Government had granted a course in Chiropraxy as vocational training to returned soldiers. Your Canadian Medical Association on learning the facts immediately took steps to impress its viewpoint of this dangerous and unwarranted action upon the Government. Medical Associations from coast to coast upon being advised, promptly expressed themselves by interviews, telegrams and letters to the honourable Minister of Health with such effect that before many days had elapsed from the time of our first interview with the Minister of Health we were advised by the Government that no further courses in Chiropraxy would be granted. This is tangible evidence of the value of a dominion wide organization.

Standardization of Drugs

In the treatment of the sick there are three factors to be considered, *viz.*, the diagnostic ability of the physician, the recuperative powers of the patient and the treatment administered. Just as no chain is stronger than its weakest link so too in the treatment of disease it must be admitted that the prognosis depends upon the efficiency of all the factors mentioned. If the treatment employed only does 50% of the work which it is intended to accomplish, it is obvious that the patient suffers. A year or more ago it was pointed out to the provincial Associations that many of the drugs being used by the profession were not physiologically standardized; in many instances tinctures were found only 50% efficient. When the attention of the Federal Government was drawn to this matter we were informed that no action would be taken until a demand sufficiently strong was voiced by the profession. From coast to coast the subject was discussed with the result that from the Canadian, Provincial and smaller Medical Associations came such a deluge of requests that the Government has seen fit to establish a Bureau of Standardization, and we are informed that during the coming year many of the important tinctures will be standardized, guaranteeing to the profession that they are 100% efficient. This is an achievement for organized medicine, the value of which to the public as well as to the physician cannot be overestimated.

CONCLUSION

There are many additional points which might be emphasized in urging the profession to unite. To each one of you must occur every-day matters which call for unity of action. In the problems of Insurance Fees, Workmen's Compensation Board Relations, Temperance Laws, Contract Practice, etc. etc., we find opportunity for collaborative thought and action. I cannot too strongly urge upon you the advisability of pushing on with your provincial organization. Furthermore, I wish to impress upon you the value of the Canadian Medical Association to each and everyone of you. It is a dominion wide Association most zealously endeavouring to render every possible assistance to the medical profession from the Atlantic to the Pacific. The Great War gave Canada an opportunity to prove to the world the type of man the Canadian is. In their platoons, companies and their battalions the Canadian Army Corps was so thoroughly and efficiently organized that it proved itself second to none in the world. Let us as physicians in Canada so organize our local and provincial units, linking them up under the banner of the Canadian Medical Association, that we too will present to the world a united medical profession capable of giving the fullest expression to our opinions and doing our most effective work.

Gentlemen, this must be our objective. Let us hopefully look forward to the day when Canada will be a greater and better country with a happier, healthier and more efficient class of people because we took upon our shoulders the full responsibilities of our profession and our citizenship.

Malaria Control Operations in Relation to Ultimate Suppression of Disease.—C. C. Bass, St. Orleans, asserts that malaria has disappeared from large areas in this country and in other parts of the world, chiefly as a result of development of the country, including drainage and clearing of the forest, incident to agricultural and other industrial pursuits. Malaria prevalence is slowly but surely, decreasing over practically all of this country as a result of the steady march of civilization and settlement of the country. This process may be aided and hastened by antimosquito measures or by the proper use of quinin. Health agencies are interested in encouraging these measures. Our only present malaria control activities that actually lead to ultimate suppression of the disease are permanent drainage and filling operations. All others are temporary and must be continued indefinitely, or the tendency will be toward a return to former conditions. The cost of intensive antimosquito operations for malaria control is so great that they have not been applied to a sufficiently large part of the total malarious area of the country to affect seriously the total prevalence of the disease. The cost of such malaria control as results from infected persons taking proper quinin treatment does not involve any cost over the amount that would be spent for other remedies. Therefore, it is applicable to the malaria problem of the country as a whole, and should be emphasized and encouraged by health agencies interested in malaria control.—*Jour. Amer. Med. Association*, July 22nd, 1922.

THE RELATION BETWEEN PHYSICIAN AND DRUGGIST AND PHYSICIAN AND PATIENT FROM THE VIEWPOINT OF MEDICATION*

V. E. Henderson, M.A., M.B.

Toronto

1. The Physician's Relationship to the Pharmacist.

A DIVISION of labour and responsibility in the preparation of medicines for administration to the patient was long recognized by both physician and pharmacist. In this province both parties have departed from that ideal condition and the tendency seems to be for them to depart more and more therefrom and to become less allies than rivals in administering to the medicinal needs of the sick in the community. The pharmacist and the vendor of patent and proprietary medicines is, I am convinced, doing more to decrease the income of the medical profession and doing more harm to the general welfare of the community than the osteopaths and chiropractors. The growth of this evil has been slow, and almost unnoticed, but it is time to call a halt.

I have recently analyzed 470 prescriptions written by physicians throughout this great country and dispensed in drug stores and hospital pharmacies. In no case was the simple rebottling of proprietaries counted, though in many cases this occurred, and even such prescriptions as

℞ Frosst No. 267 were found.

In these 470 I found forty-eight, or 10%, containing incompatibilities, usually due to the use of proprietary preparations whose composition was unknown or disregarded by the physician, for instance, Elixir Lactopepsin with digitalis or even with sodium bicarbonate.

Proprietary and non-official drugs were called for in 166 prescriptions, or in 35.3%. All together in this small number of prescriptions, seventy different proprietary and non-official remedies were required. You all know that the practice of the profession requires any pharmacist to carry on his shelves over and above the drugs of the Pharmacopœia hundreds of chemicals and proprietary mixtures, many of them expensive and in many cases called for but seldom, necessitating a very heavy capital expenditure by the pharmacist and decreasing his profits greatly. Every time a physician prescribes a proprietary medicine which the druggist has only to rebottle there is a tendency to decrease the druggist's profit. When a manufacturer succeeds in getting a proprietary mixture established, he raises its cost to the pharmacist, who must either pass this on to the patient or decrease his profit.

The pharmacist says his dispensing counter does not pay and that therefor he is obliged to sell other things. Salesmanship becomes a more important part of an assistant pharmacist's training than a knowledge of drugs. Apprentices are not trained. Even the pharmacist's specialties are ordered from a manufacturing house. He learns little even about flavouring; the physicians use proprietary ones. The increased value of a qualified pharmacist as compared with a non-qualified apprentice is only about $5.00 to $7.00 a week, apprentices up to $20.00 a week, qualified men $25.00 to $27.00. These facts have been ascertained by canvassing but a small number of men and may not be quite accurate but seem to be substantially so.

Further, the physician in a very large proportion of cases does his own dispensing. In many towns the druggist has been forced to become merely a vendor of proprietaries, specialties, cameras, cigars, candy, etc. I know that by doing your own dispensing the patient comes back to you when his bottle is empty, also that the druggist gets no opportunity to keep a stock bottle of your favourite mixture and recommend it to his patients. But were our allies the pharmacists loyal, this could be prevented by marking the prescription *ne repetatur* or "repeat twice only" as may be required. An honest pharmacist would never fill for Mrs. B a prescription issued to Mrs. A. But is the practice of doing your own dispensing really ethical? Is it in the best interests of your patients? The pharmacist is supposed to be able to distinguish good from poor preparations and drugs; you are not. If you demanded that he were well-trained he would be able to do so. You know that to-day the druggist is apt to buy from the cheapest source just as are members of the medical profession and does not test nor check his remedies in any way, first because he is not trained, and secondly because he is not a professional man and does not care. In the old days he did so and took a pride in his knowledge of drugs, their sources and chemical reactions

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*Read at the Round Table, Ontario Medical Association, May 20th, 1922.

2. The Relation of the Physician to his Patient.

But let us turn to your relation to your patient. First, is it really in the best interests of your patients to do your own dispensing? Would it not pay you better to send your prescriptions to an honest pharmacist and train your patients to expect this practice?

By doing your own dispensing are you assuring to your patients the best and purest drugs that you can give them? Perhaps you are; perhaps you are doing as much as the pharmacist. In regard to the latter, we know that 73% of the Liquor Arsenicalis dispensed was found in the last survey by the Dominion analyst to be below strength, that Liquid Extract of Nux Vomica varied four times in strength, that Tinctura Camphoræ Composita and Spiritus Camphoræ were often below strength, and the pharmacist, though liable, blames the manufacturing house from which he obtained them. The products of the manufacturing houses have not been checked by the Dominion Department of Health at their source as yet. We should demand that these houses should be carefully surveyed and that the results should be made known to the profession promptly. Still, has not the old practice of having a trained man in charge of the actual dispensing a sound underlying basis? Is it not rational, especially in this age of specialization?

As errors in prescriptions are not checked by passing through the hands of a pharmacist, do not the physicians very often give small doses so as to avoid danger? Do they really give their patients medicines or *placebos?* I know many physicians who never weigh nor measure. They simply pour a little of this and a little of that into a bottle in a way they would not tolerate in a pharmacist. Is this fair to their patients? Does not the physician who dispenses *placebos* decrease his profits? Could he not train his patients to do without drugs, where the physician considers them valueless? The modern tendency certainly is either to use drugs in quantities sufficient to produce results or not at all.

Many of us were not taught to write prescriptions and we save our faces and do not display our ignorance by not doing so but by dispensing a few roughly made up mixtures, by rebottling proprietaries or stock prescriptions and handing out manufactured pills and ointments or forcing the pharmacist to do the same. It is a temptation into which we easily fall because we have no great faith in our drugs. The proprietary preparation always contains drugs on the lowest scale, especially if the drugs are potent. Consequently, they, in many cases, are lacking in effect, are really *placebos*.

We were, many of us, bred in a period of therapeutic nihilism, yet we are the easy dupes of the vendor of patent and proprietary remedies, we will prescribe or dispense any new drug once or twice, uncritically, without taking careful records, without regard to the natural history of the disease. Sometimes we are for a time optimistic, a wonderful new cure has come into our hands but gradually it is abandoned, while more often it is given up at once, and our stock of it or that of the pharmacist is a bad investment.

In the past ten years some 300 new remedies or other preparations have passed the scrutiny of the A. M. A. Of these only a very few, perhaps twenty, have any real lasting value and will continue to be used and absorbed into the Pharmacopœia.

In my judgment, if physicians used the Pharmacopœia wisely, they would find that they needed only some ten drugs not included in it and these would include the Arsphenamine group and Pituitary as the most important members.

The physicians who have not learned the use of the Pharmacopœial flavours are as a consequence easily led to use proprietary ones to the financial detriment of their patients or themselves and to the glorification of the proprietary house and the deletion of the pharmacist.

I have watched with interest the advertising of many proprietary mixtures, for example, Syrup Cocillana Co. (Parke, Davis and Co.). It contains three extinct remedies, Cocillana, at one time included in the U.S.P. but deleted as valueless, and two valueless drugs, Euphorbia and Wild Lettuce, once used by the Eclectics. Its important constituents are heroin and squill. Yet physicians are using it. Every time it is given to a patient he is not receiving that individual attention to which he is entitled. The chiropractor also gives the same treatment for all diseases. While discussing this matter with a group of physicians, the following incident occurred:

Dr. A. said to a brother practitioner, "Bill, do you remember seeing Dave Jones who had a cough?" "Yes." "You gave him a prescription." "Yes." "Well, I did not know he was your patient and when he came to me, I gave him a prescription for his cough. He looked at it and said, 'Dr. B. gave me the same prescription. It's no good.' "

Both physicians had prescribed the same proprietary. Both contributed to undermining the confidence of the patient in the profession, both to establishing the use of a proprietary. Had it seemed to cure, the patient would probably have learnt that he could buy it at a drug store without a prescription and would have advanced a step in becoming a prey to the proprietary house and the pharmacist.

Such, gentlemen, is the situation as I see it. Could we do away with patent and proprietary remedies, we would double the incomes of the profession but more important still, we would greatly improve the health of the community. The unattended sick are largely those attended by the quack and the pharmacist. They come to us so late that we can not cure, at the best we can but patch them up temporarily.

There is no doubt that the large use that physicians make of proprietary medicines contributes greatly to their recognition and use by the public. A pharmacist justifying his sale of proprietary and stock mixtures to the sick said to me once, "You know Dr. A. He is a good man, I believe. But I can treat a cough as well a he can. He gives all his patients one of two mixtures, one if the cough is dry and the other if it is moist, and between the formulæ of these preparations there is no essential difference." The next step is for the patient to buy proprietary remedies without advice save from his neighbours. A vicious circle is readily established to the detriment of the health of the community and of the incomes of the medical profession and the druggists.

The Committee on Pharmacy has this problem before us as a great task. We want your suggestions and your help.

THE APPLICATION OF THE NEW PSYCHOLOGY BY THE INTERNIST AND GENERAL PRACTITIONER*

Chas. Hunter, M.A., M.D. (Aberdeen) M.R.C.P. (London)

Associate Physician to Winnipeg General Hospital.

Associate Professor of Clinical Medicine, University of Manitoba

THE New Psychology has given a special and much needed impetus to the study of the psychology of our patients; of the man himself, and not merely the symptoms of disease in various organs of the body. This study supplements, but must not replace, a careful history of the patient's illness and antecedent diseases, given as this is, from the physical standpoint mainly; a thorough physical examination follows. In the public wards of a Hospital, where the medical student gets most of his training, one meets with acute disease, and chronic organic disease in its advanced stage. Even here, auto-suggestion and unconscious suggestion by the physician often aggravate the picture by adding a functional element. We must reassure and encourage such patients as far as we conscientiously can, taking in doubtful cases as optimistic a stand as possible.

The necessity for such reassurance and optimism is apparent. Christian Science scores its triumphs, not merely in functional, but also in organic disease, where so frequently fear and doubt cause the main suffering. We must ever consider not merely if the patient has organic disease, but also (a point often forgotten) if this disease is really causing all the symptoms. In private practice so often we find little to explain symptoms complained of; even focal infection may fail to satisfy. Let us not be satisfied with the facile diagnosis of neuralgia, neuritis, neurasthenia, or be misled by an innocent systolic murmur at the apex, or an apparent gastritis. MacKenzie insists on the frequency with which heart disease is diagnosed without justification, because of some unusual physical sign or symptom. His warning may well be extended to every organ of the body. If in doubt after careful examination, the physician should usually give the patient the benefit of that doubt. More real suffering is induced by a mistaken diagnosis of organic disease, than by occasionally overlooking it. This is not a plea for careless diagnosis, but is a considered protest against the too common view that there is no harm in warning a patient that he may have appendicitis, gall-stones, or what not, when there is little evidence to go on. Discomforts all too readily become disabilities under the fostering influence of suggestion. If it is considered a reproach for a surgeon to have a clean operation go septic, it is high time to protest against the physician instilling doubt and fear unnecessarily into a healthy man.

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*Delivered before Canadian Medical Association June 22, 1922.

The radical difference between organic disease and the neuroses must be remembered. As Jones points out, organic diseases are the result of a conflict between man and nature, in the form of physical trauma, invasion of micro-organisms and involutionary processes, while neuroses are social diseases, the result of a conflict between man and his social environment. In other words, the neurotic is in trouble; he cannot adapt himself successfully to the claims and duties laid upon him by our complex social machine. In this dilemma, the neurosis is the way out, the means of escape, the irrational answer to the mental conflict.

Modern Psychologists—McDougall here joining hands with Freud—insist that the springs of human activity are the primitive instincts of self-preservation, and of sex; and the primary emotions of fear, anger, etc., are the affective aspect of these instinctive processes. The gregarious instinct—the instinct of the herd—early appearing in our ancestry, makes the mind of the individual specifically sensitive to external opinion, and confers on the precepts of the parents, the community and the nation at large, the sanction of instinctive force.

The development of the mind is essentially social; on the egoistic infant, with its instinctive impulses, repressive forces are brought to bear in the home, enforcing standards of discipline, taste and morality. Thus arises mental conflict; a conflict between what the child wishes to do and what the traditional standards of thought and conduct in society require it to do. The personality of the individual is thus the resultant of his instinctive tendencies and his experiences.

In the development of the personality, the emotional life of the child is of the highest importance. The child's growing emotions are centred in the family circle, and "pattern" sentiments of love, hate, etc., are forged there, fateful for the future development of the child. At puberty, the family attachments are sacrificed for an independent love life. Now, among our patients, we find many an only child, a spoiled darling, wedded to the father or mother image, moulding and distorting all later attachments according to this early pattern, or actually incapable of any love life outside the family.

Thus, a married woman of 34, with 2 children, is nervous and sleepless, feels weak and dizzy, dreams much; physical examination quite negative. She complains that "nobody protects her, nobody saves her from worries and shields her as her father used to do." Her husband, a very decent fellow, saved her all he could, and she had an easy time, but like a child, she was unable to face her ordinary domestic duties, and day dreamed of the happy irresponsible time of childhood.

So too, the homes with a domineering father and two or three unmarried daughters bear tragic witness to the same situation. In one such case recently, the mother at home with three unmarried sons, had fought strenuously for years against any suggestion of their marriage, and actually developed a neurosis when one of them set up house on his own account. The difficulty is usually to recognize that the local symptoms, the headache, nausea, pains, etc., do represent the unconscious response, the appeal for help of the socially inadequate individual.

One does not often meet with so obvious a case as I had recently—a young man able to eat everything at home—however indigestible—but unable to join ladies in a light supper owing to intolerable nausea and vomiting; he had frequently to make his excuses and go home.

To cite another case; a married woman of thirty-three had suffered for years from vaginismus, for which three operations had been performed; a dilatation, a dilatation and cutting operation (both severe and painful operations, she said, and quite unsuccessful), the third operation, she remarked, was a dilatation, very slight compared with the first two, but completely successful. On asking her what happened before the third operation to render it so successful, she answered with a half shrug of the shoulders, "He became engaged." She had married a man seventeen years her senior, who was well fixed financially but with little education, and had been in love with another man though they played the game. But the body's "I will not" was stronger than the "I will" at the altar, until the spell was broken by the man's engagement.

So too, sexual anæsthesia in women is rare in a "love match", though common in a marriage of convenience, and the history of such anæsthesia may give a hint to the physician of possible wedded unhappiness, which is responsible for many a physical ache and pain. Some years ago, I saw repeatedly in consultation a married woman, who suffered from recurring violent headaches for which morphine had been repeatedly given; the headaches were considered of serious organic origin. I found a large library (recently acquired) dealing with Spiritualism; a hint of domestic unhappiness, later confirmed by separation proceedings.

In the General Hospital at present under my care, is a married woman of thirty-five, educated in a large English town, married to a Canadian, and living on a lonely farm. A succession of crop failures and her husband's poor health since his return from overseas, have brought matters to a climax; she has no physical disability beyond being a little below par, yet the history given to the house physician told only of physical illness and pain, and gave no hint of her utter hopelessness in regard to the future—the dominating factor in the case. Unable to face the situation, she has taken refuge in invalidism and is on the borderland of a psychosis at the present moment. In such a case, the patient is more or less aware (though she may not volunteer information) that the root of her disability lies in her troubles, and these are unhappily, so real and serious that we cannot help her much.

In other instances, the patient has no idea that certain experiences, remembered perfectly, have anything to do with the symptoms complained of, so the physician's materialistic attitude and diagnosis of organic disease are welcomed to silence the glimmering recognition by the patient that his worries are responsible. Thus last year, I showed at the Medical Society a young man condemned to invalidism by his medical attendant in the country. The patient, eighteen months previously, had been seized at 4 a.m. with a heart attack; pain, palpitation, and suffocation. Three months in bed were followed by seven months' convalescence at the Coast; then after a few months' clerical work, another attack occurred, after which he was advised by the doctor to give up his position, and actually did so. His heart was normal, he had walked twelve miles in three hours on the afternoon preceding his first attack, without any discomfort, had gone to bed well but could not sleep from midnight to 4 a.m. During these hours he was hopelessly fighting an impossible situation; an ardent Protestant, he had drifted into an engagement with a Catholic and now bitterly regretted it, but saw no honourable way out of his difficulty. His heart attacks, symbolically enough, represented the conversion to the physical sphere of his inner difficulties. The final heart attack, a month before I saw him, in fact solved his problem, for the engagement was broken off by the girl's mother when apprised of his serious physical condition. But this happy solution was possible only by the unconscious co-operation of the medical man.

In still other instances, the disturbing episode has been quite forgotten and is recalled to consciousness with difficulty, or possibly only under certain special conditions. It is unfortunate that Freud aroused so much antagonism by his insistence on the purely sexual origin of the neuroses; a one-sided ætiology sufficiently disproved by the war neuroses, which depend on the disturbance, not of the sex instinct, but of the instinct of self-preservation. For this antagonism has largely blinded the profession to the enormous importance and the general truth of Freud's conceptions of the unconscious, of mental conflict, repression and forgetting, and of the influence of unconscious factors in disease. These conceptions have been admitted, not only by psychiatrists, but also by leading psychologists, who in the World War turned from the investigation of healthy individuals in their laboratories, to the study of shell-shocked patients in the hospitals. A recent article by Henry Head on hysteria, shows similarly the influence of Freud.

Insisting on rigid determinism in our mental life, (no new conception), Freud points out that the phenomena of our mental life are quite unaccountable, if we consider only the content of the individual's consciousness, for continually there arise ideas, impulses, prejudices, and beliefs which seem to come from nowhere. Freud proves by many examples that slips of the tongue and pen are not accidental, but represent valid psychic acts which arise through the mutual interference of two different intentions. In the same way the forgetting of impressions and experiences which are unpleasant is common enough. Darwin records that he found it necessary to write down at once facts at variance with his theories, as they tended to escape his memory. In the neuroses also, there is difficulty in the adjustment of appetites and desires to the demands of convention and morality; a difficulty met by forgetting—repressing from consciousness—thought or memories with emotions which are unpleasant or incompatible with one's standards of thought and conduct. Forgetting here is an active process; in some cases essentially a conscious activity, but in others, wholly or largely an unconscious process both in actual forgetting and in resisting the normal tendencies of association of ideas and voluntary effort to recall the memory to consciousness. The experience forgotten is the *immediately* painful and the ultimate consequences may be more unpleasant than if we faced rationally the whole situation at once.

But it is impossible to repress without serious consequences to mental life, a system of ideas tinged with strong emotional content. For the repressed complex (as such a system is called) seeks continually to express itself; the idea may remain successfully repressed from consciousness, but the emotion, dissociated from the original idea, may appear sometimes in the form of unreasoned fear or anxiety, sometimes converted into headache, vomiting, neuralgia or paralysis. Face to face with these symptoms, the physician so often thinks only in terms of organic disease—"the man above the eyebrows" is forgotten. There is too the blind spot in the patient's mind, and the ever present tendency in all of us to rationalise; to act or think on impulse, yet to assume that we are purely rational beings, and to defend our impulsive thoughts and actions by elaborate reasoning, deceiving ourselves and others.

A little introspection and self-analysis will help the physician, and will humble him sufficiently to bear with the apparent sophistry of his patient. For the patient's confidence and goodwill must be secured by the patience and sympathetic understanding of the physician. To face unpleasant facts, to recall disagreeable memories, requires courage and honesty. Infantile habits, persisting long after they have outlived their usefulness, interfere with new adaptations necessary for mental growth; behave, in fact, like a "conditioned reflex". You will remember that Pawlow showed how, when a bell was rung in a dog's hearing each time just before food was brought, in a short time the ringing of the bell alone was sufficient to produce an outpouring of gastric juice. So we humans—doctors and patients alike—all have our "bells", to the chimes of which we dance like puppets, the while we gravely pose as truly independent and responsible masters of our destiny. Realising this by self-analysis, the physician enlists the patient's cooperation in recollecting the more or less unconscious memories.

How far this is possible, even under the most favourable relationship between doctor and patient, varies greatly. Certainly, in some cases, one is amazed sometimes at once, sometimes only gradually, to receive much information previously not in the full awareness of the patient, information obviously of direct significance in the genesis of the trouble, so that the patient admits with genuine surprise the association hitherto unremarked. The mere recollection of forgotten experience itself does nothing; the essential step, as McDougall points out, "Is the linking up of these recollections with the rest of the mind, so that they are restored to their place and relation in the total system, and thereby become amenable to the control of the reason and the will". It is the acceptance and integration of the emotional experience with the personality of the patient that effect the cure.

In very many instances, special methods of exploration—free association, hypno-analysis, and psychoanalysis—are necessary to recall the hidden memories. These methods carry one beyond the general practitioner's viewpoint, though a general knowledge of the principles of psychoanalysis, even without full acceptance of its doctrines, is of inestimable value in dealing with neurotic patients.

To close, let me quote from a letter of a patient, who had suffered from distressing heart attacks for twenty years; attacks which have not recurred for two years:

"The professional advice you gave me in the summer, in connection with my so-called heart symptoms, gave me a mental jog which has had a most wholesome effect. This idea of subconscious control has apparently a real foundation in fact for, you may be interested to know, not a sign of heart trouble have I had since I saw you. Whenever I imagine I am beginning to flutter and puff and palpitate, I remark to my soul, nervous system, ego, or whatever the thing is which controls my circulation, mental and physical, "Come out of that. Stop your nonsense; you are a relic, a broken-down fossilized wreck of an antique habit; back to the junk-pile for you, and the thing retires, cowed and shrivelling up to my subcellar of consciousness, there to suffocate from lack of air."

In the preceding remarks I have made free use, in addition to the works of Freud, Jung and Stekel, of the writings of McDougall, Trotter, Rivers, Maurice Nicoll, Ernest Jones and Mitchell.

PATHOLOGY AND BACTERIOLOGY OF EMPYEMA AND ABSCESS OF THE LUNG

JAMES MILLER, M.D.,

Professor of Pathology, Queen's University, Kingston.

THE first point to be decided is what is included within the scope of the subjects—empyema and lung abscess? Roughly speaking it comprises suppuration within the limits set by one or other parietal pleural sac.

In the first place there are the various forms of empyema. Empyema is a term which is somewhat loosely employed. Strictly speaking from the point of view of derivation, it is simply a collection of pus in the interior of the body. It has, through use and wont, come to be restricted, in the medical sense, to a collection of pus in the pleural sac. The surgeon, however, would include collections of pus in the gall bladder. We, being medical as opposed to surgical men, may define it as pus accumulations bounded on all sides by pleura either visceral, parietal or, more often, by both, and frequently limited by inflammatory adhesions.

The types which may be distinguished are first of all the (1) *Generalised* where the accumulation is limited by the boundaries of the normal pleural sac. (2) *Localised* when the pus is shut in by adhesions. The infection in these cases may come (a) by continuity from the lung itself, from a pneumonia, a septic infarct abscess or other inflammatory focus. Sometimes it is apparently an almost purely interstitial inflammation. The condition starts at the root of the lung and spreading by the perivascular lymphchannels early reaches the pleura with little alveolar involvement. (b) By continuity from the pericardial sac, the mediastinum, the œsophagus in cancer and simple ulcer (I have seen two cases of simple, peptic ulcer of the œsophagus, both ruptured into the left pleural sac with the formation of a pyo-pneumothorax) the ribs, peritoneum, liver, spleen or other contiguous organ or part (c) through a penetrating wound produced by needle, metal weapon, missile or by a fractured rib with or without injury to the lungs (d) by the blood stream in cases of septicæmia or pyæmia. In the case of the localised condition, according to the situation, one may distinguish (1) the ordinary type, limited on one side by the pleura lining the thorax wall and on the other by lung (ii) the interlobar type (iii) the diaphragmatic type bounded by lung on one side and diaphragm on the other and the (iv) pericardial type limited on one side by pericardial sac on the other by lung. These localised empyemas, especially the last three types behave very much like pulmonary abscesses, indeed, as will be emphasized later, they form the most common type of what is often, perhaps loosely, called lung abscess. It need scarcely be stated that the fluid content of the abscess wall may show all grades from slight turbidity through the sero-purulent to the purulent, from the hæmorrhagic to the purulent and may be mixed with gas thus constituting a pyo-pneumo-thorax. The path of infection in the empyema which follows lung consolidation is not always clear.

Sometimes when the pneumonic area is superficial the infection is direct. When the inflammatory focus is situated deeply, spreading probably occurs by lymph channels situated in interlobular septa and around vessels and bronchi. Gay and Rhodes have subjected this matter to experiment using a strain of streptococcus obtained from an empyema in the human subject and inoculating this into the rabbit. The pleura could be infected and empyema produced either by inoculation directly into the pleural sac or by introduction of the germ into the bronchus or lung. Infection did not occur in the reverse direction, *viz.*, from pleura to lung, suggesting the absence of lymph flow in this direction. As stated above an inflammation may be almost entirely interstitial in the lung substance and spread out into the pleura along the lymph channels.

The relation of these accumulations to their surroundings and their subsequent history depends very much upon the extent and situation. Nowadays of course in the majority of instances early diagnosis and operative treatment removes the purulent fluid and healing takes place with more or less extensive adhesions and collapse of surrounding structures. The interlobar, pericardial and diaphragmatic effusions on the other hand, being difficult to recognize and to get at by operation, not infrequently rupture into the lung substance, and become true lung abscesses, evacuating by way of a bronchus. In other words, the patient coughs up the contents of the abscess and healing results with cicatrization. Occasionally even large collections may remain unremoved without any great inconvenience to the patient, later on becoming the seat of calcareous deposit.

The term 'lung abscess' as already indicated, is often very loosely applied. The pathologist defines it as 'a suppurative inflammation involving the lung substance'. But the horizon of the pathologist is, naturally enough, limited by his post mortem experience. Conditions from which the patient does not die he is apt to pass over. From his point of view only two types exist: (1) Those arising in areas of previously diseased lung tissue, *e. g.*, following lobar or broncho-pneumonia; (2) those due to the lodgement of infective emboli. I think that all morbid anatomists will agree with me when I say that in nine cases out of ten a condition diagnosed by the clinician as pulmonary abscess proves at the post mortem examination to be something other than is defined above. It may be a localised or an interlobular empyema or possibly a bronchiectasis or a cavity. But there is something to be said for the wider view of the clinician who would include localised empyemas. Barker in his *Monographic Medicine*, excludes the perforated interlobar empyema from the category of pulmonary abscess, yet he includes rupture of hepatic, subphrenic or retro-peritoneal abscess into lung. On the whole I am inclined to accept the wider interpretation of the term and to regard as actual or potential lung abscesses suppurative foci within the limits set by one or other parietal pleura.

We may leave then this question of definition and return to pathogenesis and classification.

Pulmonary abscess may follow:

1. In the first place—*acute lobar pneumonia*. Such abscesses are small and multiple with ragged walls. They tend to fuse together to form larger cavities and they pass by insensible gradations into gangrene. More often they follow a *broncho-pneumonia* especially that known as aspiration or deglutition pneumonia associated with a low state of vitality and following operation and wounds of the mouth and neck. This also is a small multiple abscess with ragged walls which passes on rapidly into gangrene and is, therefore, seldom met with in the abscess stage.

2. In the second place it may follow, trauma, the puncture of the exploring needle or a fractured rib, a stab or a gunshot wound. Abscesses so produced are rare. I cannot recall ever having seen one of this type.

3. Thirdly, we have abscess due to perforation from within brought about by simple ulcer or cancer of œsophagus eroding the lung or bronchus, (such rapidly goes on to gangrene), by abscess of the liver or by suppurating hydatids, by subdiaphragmatic abscess or by empyema opening into the lung substance. The last is comparatively common, frequently heals spontareously and is rarely seen in the post mortem room.

4. Fourthly, there is the abscess which forms in relation to an inspired foreign body—a tooth or bone or some such non-absorbable substance. I have seen one such in relation to a tooth and another specimen in which the foreign material was a chicken bone. Such a condition usually rapidly goes on to gangrene.

It should be stated here that it would for present purposes be useless to draw any hard and fast line between abscess and gangrene of the lung. Any devitalised or dead area of lung tissue such as an infarct, any raw and ragged surface communicating with a bronchus may become the seat of growth of putrefactive bacteria and pass from the consolidated state into the gangrenous. Manges (*Journ. of American Med. Assoc.*, 1915, May 8th, 1920, p. 124) mentions a breaking down necrotic gumma as a possible origin for pulmonary abscess.

5. In the fifth place we have the embolic abscess associated with a pyæmia due to, (a) middle ear disease and thrombosis in the lateral sinus; (b) phlebitis, *e. g.*, in veins of lower limbs; (c) liver abscess; (d) puerperal septicæmia; (e) ulcerative endocarditis; (f) acute osteomyelitis. In my experience the first is the commonest cause of this type of lung abscess. Indeed it is the usual termination of this type of case. An infective embolus from the softening clot in the lateral sinus is strained out from the blood in its passage through the lungs and an acute inflammatory focus is set up (embolic pneumonia) which rapidly softens and develops into an abscess. Such abscesses are small, numerous and irregularly scattered through both lungs. They are seldom diagnosed clinically as abscesses and their importance is merely scientific as the patient inevitably dies of the causal pyæmia. They may be associated with septic infarcts and frequently go on to gangrene.

6. Lastly we have as possible abscesses bronchiectatic or tuberculous cavities. Such are not classified in this way. Alexander James in his book on pleurisy mentions dilated bronchi amongst the causes of abscess of the lung. There is no real reason why either should not be so regarded when the limiting bronchial wall disappears. One type of multiple dilated bronchus or bronchiole known as 'honeycomb lung' is occasionally seen. It occurs in children and follows broncho-pneumonia. It is usually limited to one particular lobe and shows multiple cavities filled with pus which on suitable staining show in their walls the structure of bronchioles.

Barker (*loc. cit*) distinguishes what he calls chronic abscess of the lung or chronic ulcerative pneumonia. This, in his own words "occurs in the course of subacute indurative pneumonia or in cirrhosis of the lung where necrosis may result from insufficient blood supply in the indurated tissue." This is a condition with which I am unfamiliar.

Before leaving the question of pulmonary abscess it may be asked, What is it which causes some organisms merely to consolidate the lung while others soften it and break it down? Again, why may an organism at one time consolidate and at another time liquify?

The type of organism which appears always to liquify is the staphylococcus. In pyæmias in which this is the main or only germ liquifaction occurs early. Streptococci and pneumococci on the other hand probably require to be present in very large numbers before softening occurs. In an ordinary pneumonia due to one or other of these organisms germs are only present in sufficient numbers to demonstrate in the early stages. They then progressively disappear as resolution occurs. Lord (*Journ. of Exp. Med.*, Vol. 30, 1919, p. 379), suggests that resolution in pneumonia is due to biochemical changes in the course of which the acid death-point of the pneumococci is reached. In cases where softening and abscess formation occurs a secondary marked increase in numbers takes place. The determining factors are always two (1) the virulence of the germ (2) the resistance of the individual. Probably it is the latter factor which is the important one in most instances.

Where putrefactive germs gain access to devitalised or dead areas liquifaction takes place early and rapidly. This inevitably results in gangrene. The nature of the germs concerned will be dealt with later.

Bacteriology

For the purpose of the present discussion we may consider the matter under the headings of the various germs rather than under that of the lesions produced.

In empyema the common primary organisms are pneumococci and streptococci. In military cases during the recent severe influenza epidemic streptococci were found much more frequently than pneumococci (J. E. Gordon, *Journ. Infect. Diseases*, Vol. 26, No. 1, p. 29, 1920). These streptococci were hæmolytic in type. Gordon found, however, that in the chronic cases the hæmolytic streptococci tended to be replaced by staphylococci, B proteus, diphtheroid bacilli and more especially a gram-negative bacillus of the Friedländer group.

This preponderance of streptococci is probably due to the peculiar type of epidemic. In normal times pneumococci play a much more important role. All the various types have been found in cases of empyema. Sometimes (J. E. Gordon, *loc. cit.*) the germ found in the lung has been a pneumococcus and the organism discovered in the empyema a streptococcus. Not infrequently in the cases following pneumonia the pus has been found sterile due to the fact that the causal germ has died out.

Other organisms isolated from cases of empyema are: B. paratyphosus A. & B. Meningococcus, streptothrix actinomyes. These are more or less 'fancy' germs. Organisms more often met with either alone or in association with pneumococci and streptococci are B. pyo-cyaneus and B. influenzae. In cases due to infection from the abdomen and from the œsophagus a large number of germs of intestinal origin, some of them gas producers and spore bearers, are found. In one or two cases the true diphtheria bacillus has been isolated.

In lung abscess the type of germ met with depends upon the origin of the condition. Following lobar or broncho-pneumonia pneumococci and streptococci are again most common although B influenzae has been found. In the embolic type staphylococci and streptococci are commonest but sometimes mixed infection occurs. Usually, however, even if the primary condition—middle ear disease, osteomyelitis, puerperal infection—is a mixed one, a straining out of adventitious germs occurs and the lung abscess is a pure staphylococcus or streptococcus infection.

In the type due to penetrating wounds a large number of organisms occur. Gas gangrene germs are not infrequently met with both in empyemas and lung abscess. Whenever gangrene is superadded on a softening process germs of this type tend to occur often along with B. proteus and other putrefactive organisms. Buday (*Ziegler's Beitrage*, 1910, Vol. 48, p. 70) was one of the first to point out the association of the combination of spirilla and B. fusiformis in gangrenous conditions of the lung. Quite a number of these cases of spirochaetal organisms in sputum from lung cavities have been described.

In bronchiectasis and tubercle cavities a vast number of organisms are present amongst which streptococci and pneumococci constantly occur.

THE VALUE OF COLOSTRUM TO THE NEWBORN*

Gladys L. Boyd, M.B.,

Research Fellow in Pediatrics, Toronto

THE transmission of a degree of immunity from parent to offspring has long been recognized clinically, by the resistance of infants to certain diseases, and experimentally by biologic tests on the infant's blood. Ehrlich[1], in 1892, proved the specific immunity of the offspring to be in the nature of a passive immunity, and not inherited in the otogenetic sense. His experiments were later confirmed by numerous investigators. The immunity must then be conferred to the infant by the passage of antibodies from the mother's blood through the placenta or through the mammary gland.

In 1912, Famulener[2] reported a series of experiments on the passage of specific hemolysins from goats to their progeny. He considered the colostrum as the important means of transmission, as he found that it contained large amounts of the specific hemolysin, and the serum of kid's receiving it possessed a high degree of hemolysing power, while the serum of those deprived of it was only weakly hemolytic. In goats immunized during gestation, the early secretion of the mammary glands was rich in specific hemolysins. This hemolytic power rapidly fell until by the time milk was secreted it was practically negligible. He also noted that the power of producing antibodies in the newborn was weak.

Chemically, colostrum differs from milk in the quantity and quality of its proteins and its higher salt content. Globulin is found in milk only in traces, up to .03 per cent., but forms a good proportion of the 13-14 per cent. of coagulable protein in colostrum. Crowther and Raistrick[5] examined the fluid obtained from ten milkings a day after parturition, and noted a rapid fall in the total nitrogen, and particularly in the globulin within the first forty-eight hours.

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*From the Nutritional Research Laboratories of the University of Toronto and the Hospital for Sick Children, and the infant wards of the Toronto General Hospital.

Biological tests show lacto-globulin to be identical with the serum globulin, while lactalbumin is a distinct protein.

Howe[3] of the Rockfeller Institute, recently reported some observations on the nitrogen partition in the serum of calves, before and after the ingestion of colostrum. He found a much more rapid rise in the globulin, particularly the englobulin content of the serum after the ingestion of colostrum, than when the animal received no colostrum. The close association of antibodies with globulins makes these findings significant.

We repeated Howe's experiments on newborn infants. Umbilical blood was taken at birth, and venous blood at varying intervals after and the nitrogen partition in the serum determined. Three infants of the series received no colostrum. The others all received colostrum at regular intervals, starting six hours after birth.

TABLE I.

SERUM FROM UMBILICAL BLOOD

	Total N.	N.P.N.	Glob.	Alb.	Eug.	Pseudo glob. I	Pseudo glob. II.
1	.670	.029	.270	.430	000	.121	.080
2	.760	.035	.269	.473	.006	.110	.098
3	.928	.038	.459	.439	000	.230	.228
4	.749	.028	.400	.320	.003	.214	.183
5	.689	.031	.450	.208	.002	.255	.189
6	.743	.029	.314	.400	000	.204	.100
7	.830	.030	.389	.401	000	.280	.107
8	.800	.025	.325	.450	.003	.200	.122
9	.732	.030	.230	.472	.001	.130	.100
10	.918	.035	.310	.573	.002	.200	.108

TABLE II.

SERUM FROM INFANTS WHICH RECEIVED COLOSTRUM FROM SIX HOURS AFTER BIRTH

	Total N	N.P.N.	Glob.	Alb.	Eug.	Pseudo glob. I	Pseudo glob. II
24 h. (4)	.780	.027	.415	.338	.045	.200	.170
48 h. (5)	.710	.032	.500	.278	.200	.260	.140
96 h. (3)	.800	.035	.410	.308	.008	.263	.131
(7)	.910	.028	.498	.394	.109	.200	.189
5 days							
(1)	.710	.030	.371	.309	.090	.138	.140
(6)	.834	.030	.428	.375	.098	.230	.100
(2)	.803	.034	.360	.409	.100	.145	.115

Number in brackets refers to number of case in Table I

TABLE III.

SERUM OF INFANTS RECEIVING NO COLOSTRUM

	Total N	N.P.N.	Alb.	Glob.	Eug.	Pseudo glob. I.	Pseudo glob. II.
48 h. (9)	.750	.031	.400	.350	.009	.240	.101
5 days. (8)	.850	.027	.423	.400	.009	.211	.180
6 days. (10)	.920	.035	.485	.400	.018	.200	.180

Number in brackets refers to number of case in Table I.

The tables indicate the nitrogen partition in the infant's serum. The globulin consists of two portions, englobulin and pseudoglobulin. The latter globulin apparently contains two globulins, designated in the table as pseudoglobulin I and pseudoglobulin II, which are completely precipitated by concentrations of sodium sulphate at approximately 17.4 and 21–22 per cent. respectively.

SUMMARY

1. The blood of the newborn before ingestion of any food, contains relatively small quantities of globulin and negligible amounts of euglobulin.

2. In infants receiving colostrum within a few hours after birth, there is a marked and early rise in the englobulin and pseudo globulin, and an increase in the proportion of total globulin.

3. In infants deprived of colostrum, the globulin content of the serum remains low, and euglobulin is only present in traces.

Since the above work was begun, a report of similar observations in a few cases has appeared in the *Journal of the American Medical Association*, by Lewis and Wells. *J.A.M.A.*, Vol. 78, 12-863.

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A REPORT OF A MEDICAL SURVEY IN THE WABASKA DISTRICT

W. W. Bell, M. D.

IN making a medical survey of the Wabaska District, we left Athabaska on May 22nd, and reached Stony Point, which is about six miles from Wabaska itself, on June 1st. In making our way from one part of the District to another, we paddled, in all, about two hundred miles; from Athabaska to Sandy Lake was a hundred miles by wagon, and from Wabaska to Sawridge was ninety miles by pack horse. In many places the roads were little better than blazed trails through the muskeg: at one point, at Rock Island Lake, the streams were in flood, and a bridge had to be constructed before we could get our horses across.

The three principal places visited by us were (1) Calling Lake, the centre of a district fifty miles in diameter, with, roughly, one hundred and fifty inhabitants; here we vaccinated 43 persons; (2) Sandy Lake, where we vaccinated 21 treaty Indians; and (3) Stony Point, where, at the Roman Catholic Mission, we vaccinated 125 half-breeds, and 61 treaty Indians.

During the trip we vaccinated in all 462 persons. Practically all our vaccinations were successful. Small-pox is common among the natives and half-breeds: there is also much tuberculosis amongst them; and many are infected with venereal disease.

Of the fifty-nine children attending the Roman Catholic Schools at Stony Point, fourteen were half-breed, and forty-five were Indian; we found in twelve of these signs of hereditary syphilis, nineteen had symptoms of tuberculosis. The chief trouble with the people throughout all this district is laziness. The children are allowed to do what they like at all times. There is no discipline: only girls are made to do any work. The result is that when the boys reach manhood they refuse to work except under compulsion and live with their parents, often when they marry bringing their wives back to their parents' small tepee to crowd it still more. Another cause of trouble is a propensity for gambling, and an absolute inability to value money. Added to this is a love for any kind of spiritnous liquor, many forms of which they make for themselves by using prunes, raisins, potatoes and sometimes flour and wheat. These are boiled and some yeast added and the whole set aside to ripen. It never gets a chance to ripen for more than two weeks.

The need of all this district is efficient police officers. The people are potentially cowards and if a policeman showed any determination whatever he could have them in complete control in forty-eight hours. The natives should be given a revised Health Act requiring that not more than one family should live in any one-roomed house or tepee, and that when young men marry, they should provide a house of their own, and if the officer were urged to see that these clauses were carried out, and if further he should be given liberty to go ahead and do whatever he thought right, and necessary, with the assurance that his judgment would be backed by the Province, then he might be able to do much to correct the conditions now existing. As it is now, as many individuals as can crowd in and live together, whether they be related or not, occupy one tepee, with the result that there is a very imperfect code of morality among them. Many of the young girls of fifteen and sixteen are mothers without husbands, many husbands are living with other men's wives. Most of the men admit having had the "sickness," (venereal) but have been "cured" by Indian medicine. In consequence venereal diseases are spreading rapidly. The death rate among children must be more than fifty per cent. Another generation will likely see few left; two generations will see them all gone.

During the summer tuberculosis lessens as they live outdoors day and night. In the winter many succumb to this disease. An interesting custom among them is that as soon as an individual gets sick he wraps himself in a blanket, and goes to call on his friends, sleeping wherever he can find room, and giving the disease every chance to spread. Under these conditions it is hard to maintain any adequate quarantine, but with the assistance of the priests, I was able to keep all the smallpox cases together on North Lake Wabiskaw.

Another interesting custom is the method of handling maternity cases. The expectant mother hangs over a pole tied at such a height that her knees barely touch the ground, the pole passing beneath the arm-pits. In this position she remains for three or four hours till the child is expelled. Then the midwife present ties the cord and wraps the babe in a moss bag. There the child remains day and night, tied so that it cannot move hand or foot until it is old enough to learn to walk. It is nursed whenever it cries, and is removed once or twice a day and given a dry rub, never a bath. Its cradle is a crude hammock made by swinging a blanket on two ropes from the tent poles, or from the ceiling of the shack. Even at two and three years of age children are put to breast when they cry or are frightened. They are never punished and never washed.

The people of that district need someone to manage them who will enter into their living tents and order their lives for them, someone whom they are forced to obey. Little or nothing can be done for the old folks, except to make them live along sanitary lines, but the children might be helped by being taught discipline.

The question of rations as supplied by the Indian Department, requires careful consideration by the Government. The giving of rations in my opinion is doing more to degrade the Indians than any other cause. It is proper that they be kept from starving at times when there is no fur and no game, but it is not desirable that the food be given free of cost and without work. They are able to work and should be made to work out the value of every bit of food they receive.. This could be managed in several ways. The best way would be to make them do road work, clearing the trails and putting down corduroy. For this work the R.M.P. would likely be better than the A.P.P., as the Indians come under the Federal Government. Another way would be to make them do garden work or even to make moccasins out of skin supplied. In this way their sense of moral responsibility instead of being obliterated by false charity might be stimulated to new growth. Certainly if they knew that they had to work for rations, they would come less often for them. Not a few gamble with their rations; others trade them for prunes and raisins and the other articles necessary for making spirituous drinks. Some come in with a good catch of fur, spend the proceeds in silks and satins, and then ask for rations because they have nothing to eat. The giving of food at such times is not justice but a definite wrong and is causing a very rapid degeneration mentally, morally and physically. They need a manager who will make them work, as much as they need medical aid.

The white people at Calling Lake are anxious for a hospital. There is a definite need for one. In answering their requests I told them to write to the Department of Public Health offering to get out the necessary logs and put up the buildings, if the Department would supply a nurse and equipment. I made no promise that such an offer would be accepted.

SUMMARY OF CASES TREATED

Smallpox	72
Syphilis,	
Primary	23
Hereditary	18
Tuberculosis,	
Pulmonary	38
Hip	3
Glands of neck	4
Elbow	1
Cancer	
Of Bladder	1
Of Breast	1
Of Uterus	1
Chronic Mastitis	1
Duodenal Ulcer	1
Salpingitis	1
Bad teeth	Most of them
Heart trouble	2
Unclean sores	1
Mumps	2
Chickenpox	4
Rodent Ulcer	2
Axe cut	1
Knife cut	1
Broken arm	1
Perfectly normal	9
	188

Almost everyone whom I observed while vaccinating appeared to have pulmonary tuberculosis. Many of the children had Hutchinson teeth, and nearly all had very bad teeth.

ROENTGEN RAY DIAGNOSIS OF TUBERCULOSIS OF THE BONES AND JOINTS

A. E. Walkey, M.D.

Hamilton General Hospital, Hamilton

THE object of this paper is not to give a complete exposition on the subject of tuberculosis in bones and joints, but rather to give a short synopsis of the distinctive features which may be regarded as typical of tuberculosis in bones and joints, and to demonstrate these features by means of lantern slides.

Although in many cases the actual diagnosis of tuberculous arthritis can be made without the X-Ray, and in some instances it can be made earlier by clinical methods than it can by the radiogram, yet there is no other method of examination by which the exact location, the extent, and the intensity of the morbid process can be so definitely determined. On the other hand the X-Ray diagnosis often plays a decisive part in cases where the clinical picture would seem to indicate tuberculosis, but by the X-Ray examination the non-tubercular nature of the lesion can be established.

In our interpretation of all X-Ray plates we need to keep clearly in mind that what we see on the plate are shadows, and that these shadows depend entirely on the varying densities of the substances interposed between the X-Ray and the plate. In order that we may correctly interpret these shadows, it is very essential that we know the normal appearance, so that very frequently in examining the suspected bone or joint it is advisable to take the corresponding bone or joint of the opposite limb for comparison.

In order that a tuberculous or any other pathological lesion may be seen on the plate, it is essential that a visible change has taken place in the density of the tissues. As the shadow produced on the plate by bone is due practically entirely to the mineral content, so it follows that the only two possible changes in bone that will give different shadows are, either an increase or a decrease of this mineral content. If this change has not taken place, we cannot expect to find any evidence of bone pathology on the plate.

This is frequently the case in early tuberculosis, so that the clinical symptoms may be quite positive, and yet radiographically there is no change to be noted. This is also the case in acute osteomyelitis; the clinical symptoms will be typical, the surgeon on operating will find the medulla and the haversian canals full of pus, and yet no change is to be seen on the plate, simply because at that stage there has been no bone destruction or absorption of the mineral content of the bone. A plate taken a few days later in the case of osteomyelitis, or a few weeks later in the case of tuberculosis, will probably show the typical diagnostic appearance. From these considerations it will be seen that although a positive finding is of the utmost importance, yet a negative finding must be interpreted with the utmost caution, since many early pathological processes are lacking in the physical properties which are essential for reproduction on the plate.

Let us now consider the distinctive features as demonstrated on the plate, features which should guide our judgment in the making of a diagnosis of tuberculous infection of the bones or joints.

The normal joint consists of the capsule and ligaments, the articulating surface covered with cartilage, and the whole lined with synovial membrane. As there is no free bone or periosteum in the joint, we shall have to consider first the changes that take place in the other structures.

First of all, in the case of tuberculous arthritis, there is to be noted a haziness of the joint as if a very poor plate had been taken, but the bone a short distance from the joint will be sharp and clear, thus showing that the trouble is in the joint itself. This haziness is due to the condensation and thickening of the capsule and synovial membrane, with some fluid formation.

The next stage is the gradual destruction of the articulating cartilage, and although the cartilage is not to be seen on the plate, we can infer this destruction by the fact that the joint space is narrower than in the normal. The cartilage having been destroyed, the disease erodes the underlying bone, and it becomes irregular with somewhat of a scalloped effect.

Owing to the pain in the joint upon movement, the joint is fixed, and as a result we get atrophy of the ends of the bones around the joint an atrophy which increases with the duration of the disease.

This atrophy is characterized by a uniform thinning of the cancellous tissues, the cortex remaining sharply defined and clear cut. The atrophy is due to disuse of the bones and muscles, and will take place around any joint that is placed at rest for any considerable time.

The joint being placed at rest by nature or by mechanical means, the disease subsides and regeneration takes place. As cartilage once destroyed does not tend to reform, the only substances by which it can be replaced are fibrous tissue or bone, and in the case of tuberculous arthritis it is replaced by fibrous tissue. In fact one of the characteristic features of tuberculosis of joints or bones is, that during the progress of the disease there is no new bone formation, and even during regression bone regeneration is very limited, so that ankylosis is mostly fibrous in nature. In the case where a tuberculous abscess has been opened, it frequently becomes infected by other germs, and there may be a large amount of new bone formation, but in an uncomplicated tuberculous joint, there would be little, if any, new bone formation.

We will next consider tuberculosis in bone. The focus is nearly always in or close to the epiphysis. The first bone change to be noted on the plate will likely be, a round translucent area about the size of a pea, with the surrounding cancellous tissue well preserved save for a narrow turbid zone around the necrotic area. The focus has the appearance of being cut out of the bone.

As the disease progresses, this area extends towards the end of the bone, until the articulating cartilage is reached and eroded, and then all the symptoms of a tuberculous arthritis are set up.

The distinctive features of tuberculosis of bones and joints may be summed up as follows:—

(A). JOINT TUBERCULOSIS

1.—A uniform thinning of the cancellous tissue—atrophy.

2.—A well defined cortex.

3.—Condensation and broadening of the capsule.

4.—Cartilage destroyed or reduced in depth.

5.—Erosion of the articulating surfaces of the bone.

6.—No new bone formation.

(B). BONE TUBERCULOSIS

1.—A local bone focus usually in the epiphysis.

2.—A round outline of focus.

3.—Not extended along the shaft.

4.—Purely a destructive character—no bone regeneration.

5.—Extends to and involves the joint.

Any one of these signs in itself does not, as a rule, constitute a positive diagnosis of tuberculosis, but taken together and compared with the symptoms presented by other forms of bone diseases, they will usually give a decisive finding.

The Sex Incidence of Appendicitis.—Backman (*Acta Medica Scandinavica*, April 22nd, 1922) has investigated the sex incidence of 933 consecutive cases of appendicitis operated on in the period 1909–15. He found that the males were represented by 335, the females by 598 cases, the percentages being 35.9 and 64 1 respectively. Classifying his cases according as the disease was simply catarrhal or destructive at the time of operation the author found that in the catarrhal class there were only 194 males to 465 females, whereas in the destructive class the numbers were approximately equal (141 males to 133 females). Discussing the comparative frequency of simple catarrhal appendicitis in females the author notes that in this class 50 per cent. of the females suffered from chronic constipation, whereas this was the case only in 24 per cent. of the males, and he suggests that chronic constipation is largely responsible for the genesis of catarrhal appendicitis in women. Catarrhal appendicitis terminates in destructive appendicitis more frequently in the male than in the female because the appendix of the male has a single, not a double, blood supply.—*Brit. Med. Jour.*, Aug. 22nd, 1922.

POISONING FROM THE EXTERNAL USE OF RESORCIN*

Stanley G. Graham, M.B. (Tor.) and Frederick F. Tisdall, M.D. (Tor.)

Toronto

RESORCIN was employed about thirty years ago as an internal remedy for its supposed antiseptic effect in different intestinal disturbances in children. A number of instances of poisoning followed its use, so that its employment in later years as an intestinal disinfectant was discontinued. For many years, however, resorcin has been used extensively in the local treatment of various skin affections, and it has been generally considered that no danger accompanied this use of the drug. Recently, two cases which showed signs of poisoning after the external use of resorcin were encountered in this clinic.

Report of Cases

Case 1.—Baby A. H., 6 weeks of age, was admitted to the infant ward on June 3 1921, with a severe eczema of three weeks duration. The infant was breast-fed for first two weeks, and then fed on a modified whole milk mixture. Examination showed a well developed and well nourished baby; weight eight pounds. The skin on the head and face was covered with a dried sero-purulent exudate. On the trunk and extremities the eruption was very red and moist, patchy in distribution, but becoming confluent in such areas as the neck, elbows and buttocks. For the first four days after admission starch poultices were applied. On June 7th an ointment containing approximately 8 per cent. resorcin was applied to practically the entire skin surface three times during the day. On June 8th the treatment was applied as usual in the morning and again at 2 p.m. About 3 p.m. the infant "collapsed." The skin which had previously been a bright red became pale and ashen-colored. The eyes appeared sunken and were rolled upwards. Mustard baths and stimulants were given freely to combat these symptoms. At 6 p.m. the ointment was again applied. The baby was now comatose. The respirations were slow and shallow. The pulse was weak and thready. At 3 p.m. on June 9th she had a convulsion lasting 10 to 15 minutes. Further treatment with the ointment was discontinued, and at 9 a.m. 240 cubic centimetres of blood were withdrawn from the long sinus, while 300 cubic centimetres of the mother's blood were injected into one of the small veins of the leg. This caused a most marked improvement in the infant's condition. The respiration and pulse steadily improved and the ashen-grey color of the skin disappeared. Twenty-four hours later she had quite recovered and showed no further symptoms of collapse. The resorcin ointment was not again applied, but olive oil containing 4 per cent. resorcin was applied to scalp only, with no untoward symptoms.

Case 2.—Baby W. C., 2 months old, was admitted to the infant ward on September 29, 1921, with an eczema of six weeks duration. Until three weeks of age baby was breast-fed, then for the following three weeks alternate breast and bottle feedings were given. Later she was fed entirely on a modified cow's milk mixture with a moderate amount of carbohydrate added. Examination showed a well developed but undernourished infant; 8½ lbs. in weight. On admission she was suffering from a mild upper respiratory infection. The eruption was most marked on the head, neck and buttocks, but was also present on the trunk in many isolated areas. Very few "crusts" were present. The affected surface was constantly moist and bright red in color. For four days following admission, a starch powder containing 1 per cent. calomel was applied with little or no improvement. Beginning October 4th, an ointment which contained 4 per cent. resorcin was applied to the involved areas night and morning. This treatment was continued for 3 days. On October 7th, the ointment was applied as usual in the morning. About 10 a.m. the baby "collapsed." The skin was ashen-grey in color. Respirations were slowed and somewhat shallow

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*From the wards of The Hospital for Sick Children, Toronto, Ontario, The temperature was maintained by means of hot water bottles and stimulants were given freely. At 12 o'clock the infant was comatose. The eyeballs were rolled upwards and the pulse was weak. The baby was then given 100 cubic centimetres of blood from the mother. During the next few hours the condition seemed to be improving gradually, and in twelve hours the baby's condition was again satisfactory. The ointment had been removed at the onset of the symptoms and was not again applied.

On October 18th, the rash appeared to have improved but slightly. Keeping in mind the absorption of poisonous amounts of resorcin, it was decided to try again its application to the eruption. Accordingly, in the morning, olive oil containing 4 per cent. resorcin was applied freely to the broken surface. On the same afternoon the nurse reported that the baby was not looking so well. Examination showed an ashen-grey color of the skin which had not previously been present. The baby was very quiet and listless and the eyeballs were rolled upwards. The resorcin was discontinued, and on the next day there was no suggestion of any of these signs.

A specimen of urine was obtained previous to this application of the resorcin, and also another after the symptoms of collapse appeared. The total phenols, which include resorcin, were then determined in both specimens by a method described by one of us[1]. A marked increase was found in the quantity of phenol present in the second specimen, and when a portion of this urine was exposed to the air for some time, it became quite black in color.

A search of the literature reveals five cases of resorcin poisoning, following the external use of this drug. Symptoms similar to those encountered in the two cases here reported were present in nearly every instance. The following is a brief account of these five cases.

Case 1.—Reported by Kaiser[2]. Male, age 29 years. Admitted with psoriasis. 100 grams of a 50 per cent. resorcin paste were applied. Shortly after this the patient complained of a burning sensation over the area of application. He began to sweat profusely and the house physician was called. Although the paste was removed about three-quarters of an hour after its application, the patient became unconscious a few minutes later. His pupils were dilated, the pulse was weak and very rapid and the breathing shallow and rapid. At times the whole body became spastic. The patient regained consciousness in about an hour and was given strong coffee and diuretin. About three and a half hours after the application of the paste, greenish colored urine was passed. In this the presence of phenols was demonstrated. In the course of three or four days the patient completely recovered.

Case 2.—Reported by Nothen[3]. Male, age 19 years. Admitted with eczema. 220 grams of a 9 per cent resorcin paste were given by inunction. Almost immediately the patient complained of vertigo and soon lost consciousness. Cyanosis rapidly supervened and the skin became cold and covered with prespiration. The pupils were contracted and fixed; the pulse was rapid and the respiration both rapid and shallow. The ointment was quickly removed and venesection performed. An injection of camphor was given. About four hours after application of the paste the patient regained consciousness for a few moments, then fell into a deep sleep. The next morning he was much improved and in a few days completely recovered.

Case 3.—Reported by Nothen[3]. Infant 11 days old. Admitted with phemphigus neonatorum involving the skin of the head, chest and arms. A 3 per cent. resorcin paste was applied. In about two hours the nurse found the child dead.

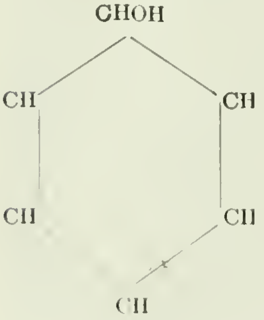
Case 4.—Reported by Boeck[4]. Male, age 16 years. Admitted with lupus vulgaris. A 25 per cent. resorcin paste was applied to the left calf on which the skin was almost entirely intact. One and a half hours later patient was found unconscious. He had slight twitchings of the right arm which soon involved the whole body. He was markedly cyanosed and the skin covered with perspiration. The respirations were frequent, and the pulse rate increased to 150 per minute. A venesection was performed and camphor injected with no apparent beneficial effect. The pupils were at first dilated, later contracted. The patient died without regaining consciousness about ten hours after the application of the ointment.

Case 5.—Reported by Kyrle[5]. Male, age 2 years, was treated for "Herpes tonsurans maculosus" with a 10 per cent resorcin solution. Dressings moistened with the solution were twice applied to both thighs in the course of an evening. The skin over this area on which the dressings were applied was almost intact. The next morning the boy became unconscious, with marked cyanosis. The skin was covered with perspiration. The respirations were frequent and superficial and the pulse weak and irregular. The pupils were dilated. Slight convulsions appeared, chiefly of the face and upper extremities. Heat was applied to the whole body and injections of camphor were given. The condition gradually improved, and the following day the child was almost completely recovered. Greenish colored urine was passed.

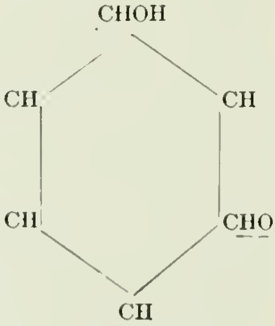
Discussion

It is well known that patients suffering from infantile eczema frequently collapse and die. No adequate reason has been advanced to explain the occurrence. The possibility of such a condition existing in the two cases reported above must be considered. However, in both instances the collapse occurred after the application of resorcin paste. In one case the symptoms disappeared after the removal of the ointment only to recur when it was again applied some days later. It should also be noted that in these cases the skin area to which the resorcin was applied was not only extensive but presented a raw and bleeding surface which, of course, was most suitable for the rapid absorption ofthe drug.

Resorcin belongs to the phenloic group of substances and is closely related to carbolic acid as the following formulæ show:



Carbolic



Resorcin

Its action is somewhat similar to that of carbolic acid, but it is less irritant and less poisonous. Members of this group of substances when absorbed by the body are conjugated, largely in the liver, with sulphuric or glucuronic acid to form non-toxic esters which are then excreted by the kidneys.

A consideration of the mode of action of resorcin in these cases is of interest. Three theories are suggested:

1. A very rapid absorption from the skin of an overwhelming amount of the drug.

2. A moderate absorption with the failure of the liver to convert this into a non-toxic substance.

3. An increased sensitiveness or idiosyncrasy of certain cases to the drug itself.

In our two cases the ointment was applied to extensive raw areas from which the drug could be absorbed with great rapidity. On the other hand, in some of the cases reported the poisoning occurred after the application of resorcin to relatively small areas of practically intact skin. In these cases it is not unreasonable to assume that the patients either had a marked idiosyncrasy to the drug, or else when absorbed it was not detoxicated in the usual manner. A case of unusual sensitiveness to resorcin has been reported by Montgomery[6]. In this instance the application of resorcin to the skin resulted in a severe dermatitis. This local reaction could not be due to a failure of the liver to render the drug non-toxic after its absorption, but must have been due to an idiosyncrasy to the drug itself.

Numerous cases are on record in which considerable absorption of resorcin occurred after the internal use of the drug, but no symptoms of poisoning appeared, probably because the body rendered the substance non-toxic shortly after its absorption. In these cases large quantities of resorcin were actually absorbed because the urines excreted were greenish in color, and when exposed to the air soon turned black.

From the information available it is evident that there are many points in favor of each of the three theories advanced, and it is difficult to state which factor is the most important one. No doubt it varies in different cases.

The object of this paper is not to detract from the very excellent results which are obtained in many skin conditions by the use of resorcin, but to direct attention to the fact that in certain unusual cases symptoms of poisoning may result from the external use of this drug.

The authors desire to acknowledge their thanks to Dr. Alan Brown, Physician-in-Chief, for permission to report these cases.

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WHEN TO OPERATE ON RENAL CALCULUS*

E. J. Boardman, M.D.,

Winnipeg, Man.

On the day I decided on the subject for this paper I had just read the following:

"On the whole, any stone in the kidney or ureter is surgical without exception, when the patient is under seventy years of age. This is with or without the presence of symptoms."[1] A few days previously I had also read this: "We should conserve the kidney, and while it may be conservative to leave certain stones in, my conservative policy is to take them out wherever they are."[2].

If the treatment of a disease exhibiting such wealth of clinical variety as renal calculus can be adequately covered by accepting the dictum that every stone should be removed on sight; then, indeed, would a very great burden be lifted from the shoulders of those who have been honestly trying to weigh the evidence presented by each case and treat it upon its own individual merits. It becomes merely a straight open and shut proposition, which if good for the patient is certainly best for the surgeon, relieving him as it does, at once, both of the necessity for further exercise of that surgical diagnostic acumen he may possess, as well as all responsibility in regard to the ultimate result.

To begin with, many stones are passed spontaneously, sometimes it is true, with considerable inconvenience to the patient, but nevertheless passed, and statistics, if available, would show the number of such to exceed by many times the number of those retained. This happy termination to a more or less trying ordeal should in some degree be a matter for selfe ongratulation to the individual most interested, since it establishes the fact that the urinary passage is free of definite obstruction, and gives reasonable grounds to hope for a similar conclusion in the event of a recurrence. E. L. Keyes, New York [3], states, "That his records fail to show a case, where a kidney that has passed its first stone successfully, failed to pass the subsequent ones as well." But his experience in this differs from that of some of us.

While stone, of itself undoubtedly causes some damage to the kidney, it cannot be denied that in the majority of instances the bulk of the trouble is due to a concurrent infection, and that while the stone must be considered a constant menace to the health of the individual, it is often tolerated during many years of comfortable life with apparent impunity. Its discovery, therefore, in the course of routine examination, or suggested by some slight grumbling discomfort, does not constitute an emergency necessitating immediate operation; but rather may be viewed with a measure of complacence while being kept under observation. There is frequently no data by which we can estimate its probable duration. It may have existed for several years, and might possibly remain for several more without material increase in size or discomfort to the patient. It should be x-rayed at least once every six months, and so long as it remains silent and of a size that might pass spontaneously should not be interfered with. A. D. Bevan, Chicago [4]. "Shall we immediately operate on these cases? Certainly not! Each one of these cases must be analysed separately as an individual problem. Where we find a single stone in the pelvis of one kidney and the patient is a good surgical risk, if that stone is one half inch or more in diameter, the c ear indication is a surgical operation and the removal of the stone through a pyelotomy." A stone over one centimeter in diameter is usually too large to pass, and if found to be on the increase should be removed before it reaches such calibre as to cause extensive damage to the kidney. Likewise, if a smaller stone suddenly begins to give tongue and cannot be quieted by simple means, it is better to operate early than to persist in palliative treatment at the risk of permanent injury from chronic or intermittent obstruction and the possibility of coincident infection. The mutilation caused by the search for a small stone in the renal parenchyma will frequently do more damage than the presence and growth of the stone over a period of years. These, like the pelvic stone, are better left until they have reached a fair size, when they will be more easily located, just as easily removed, and with relatively less trauma. Stone in the kidney is one thing, but stone + infection, or + obstruction, or + both, is an entirely different proposition. Broadly speaking, either or both of these complications constitutes an absolute indication for surgical intervention. But a dozen pus cells in the urine need not be regarded as ominous; nor an occasional period of discomfort picture to our minds a hydronephrosis; or both together a pyonephrosis; and while I have not the slightest desire to appear to treat a serious condition in a contemptuous or off-hand manner, it is, nevertheless, frequently astounding how well such infections are tolerated and how readily they clear up when the aggravating cause is removed.

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*Read before the Canadian Medical Association at Winnipeg, Man., June 22nd, 1922.

Mrs. S. M. C., small stone and abundant pus in right kidney for over two years, operation refused. Last summer, stone half inch in diameter, with abundant pus and definite albumin ring in urine. Played golf all season. Gained twenty pounds. Was runner up for provincial championship. Operation this spring by Dr. N. J. McLean. The stone was removed by pyelotomy. Pus absent in six weeks. After three months, still no pus, no albumin, *x*-ray negative, function approximately equal and normal.

A large stone in the pelvis with or without infection, that can be dealt with by pyelotomy should be removed, if the patient is otherwise a good surgical risk, but any operation which intentionally fragments a stone is to be deplored. A large branching calculus filling pelvis and calyces, in the presence of even a small remnant of renal function should usually not be interfered with unless causing very active symptoms. Its removal will necessitate a complete nephrotomy with concomitant damage to remaining healthy renal tissues variously estimated at about $\frac{1}{3}$ the whole kidney substance; with secondary hemorrhage, its dangers and anxieties constantly in the background. It must be remembered that many of these large stones are well tolerated and may probably carry on with more or less active function in comparative safety to the patient for many years before the distruction fo renal tissue due to the calculus reaches the equivalent of the surgical trauma necessitated by its immediate removal; that the probability of recurrence is easily commensurate with the amount of relief usually given; and that in addition to the risk, discomfort, inconvenience and shock usual to such operations, the possibility of a nephrectomy, either primary, secondary or emergent, looms large on the surgical horizon and can neither be forgotten or ignored. Even a lame kidney is better than none, when the support of life hangs in the balance, and we have been so frequently astonished by the activities of life allowed by a relatively small remnant of functioning renal tissue, that one is inclined to deprecate an operation which instantly and permanently destroys a large fraction of possible function in pursuit of a questionable amount of relief.

Multiple calculi while less frequent than the small single stone, occupy a very prominent place in the consideration of renal lithiasis. Numerically, they may vary from 2 or 3 small stones in the pelvis to such large numbers invading the kidney substance, that any attempt at removal short of complete nephrectomy would obviously be doomed to failure. In the first condition, if the stones are too large to pass they should be removed, and if not delay may be counselled, always bearing in mind that the danger of calculus anuria with multiple small stones is greater than with the larger variety. In the second it is usually better not to interfere, always conceding that should complications supervene, such for insrance as a small stone becoming dislodged and setting up acute obstruction, that this would necessitate immediate operation for relief, but that even in this case nothing more should be undertaken than can be accomplished by a simple pyelotomy. Between these two extremes is a wide territory where there is much room for speculation and diversity of opinion, but this much can be positively asserted. That pyelotomy in competent hands, and where necessity compels is undoubtedly the best operation for renal lithotomy. That nephrotomy with its destruction of renal tissue and other dangers incident thereto, is to be avoided whenever possible. That the presence of multiple stones may be read as indicating an alarming tendency to form such. And that embedded stones are more prone to recur than any others. Federoff[8], Leipzig, reviewing a series of 557 operations on kidneys, states: "His experience confirms that nephrolithotomy is one of the most dangerous of operations. He prefers to remove the kidney rather than cut into it, if a pyelotomy incision and a few small incisions in the parenchyma fail to answer the purpose and there is suppuration, and extensive atrophy of kidney tissue, or several calculi embedded in the parenchyma."

Bilateral Stone. Each and every problem presented by stone in one kidney may be duplicated in the other; indeed, it is no uncommon thing to find that the opposite side from that to which our attention has been called is the seat of extensive disease. The discovery of one stone should suggest the possibility of others, and should arouse rather than allay our suspicions that we had reached the root of the matter: therefore, no examination for stone is complete that does not cover the whole urinary tract. Bilateral stone, like multiple stone, suggests a more or less pronounced readiness to produce stone, and should actuate us toward non-interference where possible.

General rules for operation in this condition, and usually accepted, are tabulated by Keyes (3), as follows:

1. The kidney showing the better function should be operated on first.
2. The kidney showing acute symptoms is usually the sounder organ.
3. Impaction of stone in ureter of the sounder kidney may temporarily reduce its function below that of its fellow. Under such conditions it is safer to operate first on the side with the ureter stone.
4. Simultaneous bilateral operation may be attempted if the patient's condition is relatively good and the first operation not unduly long (30 mins.).
5. In an emergency, such as anuria, the sole object of operation should be to provide drainage to the kidney, usually by pyelotomy (which in the case of anuria should always be bilateral). Such stones as cannot be rapidly reached and readily removed should be dealt with at a subsequent operation.
6. Geraghy's formula, i.e., good concentration of urea, and of phenosulphonthalein, and a small quantity of urine (with consequent low total thalein) may be depended upon to indicate an atrophied or congenitally small kidney inadequate to support life

Stone in a single kidney or the kidney that has assumed the whole burden of the renal function does not present features that differ essentially from stone under other conditions. In fact the best we can do towards the conservation of a single kidney should also be our aim under all circumstances.

The question when to operate on renal calculus, often brings us face to face with the grave necessity of making a decision which one way or the other will seriously affect the future life and prospects of the patient, and for the making of which we have as yet no definitely established criterion on which to work; but rather only opinions of men of world renown which differ as widely as the distances from which they come. Take for instance the subject of the recurrences of stone, too large a question to be even touched on in this paper. Cabot and Crabtree[5], Boston, publish 51% of recurrences. W. F. Brassch[6], Rochester, states that "The percentage of recurrences of renal lithiasis should be less than 10%." Whereas Frayer[7], of London, believes that "recurrence is so frequent that non-surgical interference is the best policy to pursue, unless decided symptoms are present." In addition to the foregoing wide divergence of opinion, our own experience has been replete with so many instances of the post operative vagaries of calculus disease that we shrink from advising active measures in cases that appear to be doing well while left alone. One sees not a few instances in which after a series of operations on one or both kidneys, a point is reached, beyond which surgical interference is not deemed advisable, although the original condition as regards stone is as bad if not worse than at the beginning, and in these there is sometimes room for conjecture as to what the present condition might have been, had it been possible to delay that first interference.

Conservatism must not, however, be carried to the opposite extreme, for nothing is to be gained, indeed, only harm can result, from an attempt to preserve a kidney which is merely serving as a pocket for pus; a breeding ground for organisms; and a factory for toxins; the very probable site of a new stone and a very serious menace to the health of the individual. Pyonephrotic kidneys can rarely come back, and should usually be moved

Undoubtedly the majority of retained renal calculi sooner or later require operation for removal, and just as surely many cases of calculus pyonephrosis require nephrectomy. But, between the diagnosed presence of stone and its attack by radical surgery, is a border land, where such considerations as the amount of systemic disturbance; the functional value of the diseased kidney; the chemical nature of the calculus; the estimated likelihood of a recurrence, in relation to the functional value or probable menace the diseased organ will be to the patient during the interim; the probable duration of the interval; all these points and many others in relation to the second kidney as well as the general condition of the patient, constitute a territory in calculus disease which can only be covered by mature consideration of the facts in relation to the probable consequences. The time has, therefore, certainly not yet arrived when any man or body of men can lay down an absolute dictum as to when or what operation shall or shall not be done.

This survey is from the standpoint of general surgical and hospital efficiency as it actually exists, by and large, throughout the length and breadth of this great Western country.

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RADIUM THERAPY (LANTERN DEMONSTRATION)*

W. H. B. Aikins, M.D.

Toronto

DR. AIKINS preceded the presentation of the lantern slides by a general outline of the facts known regarding the value of radium in therapeutics. He laid particular emphasis on the work that had been done by radium in uterine conditions. He spoke of its value in cases of uncontrollable uterine bleeding which were of non-malignant origin. The results obtained in the treatment of such conditions warranted the use of radium as a specific in preference to any other method. In the treatment of cancer of the uterus, surgery should replace radium where the fundus was involved, but in cancer of the cervix many encouraging results had been obtained from its use. Certain surgeons had already substituted the use of radium for operative procedure in cervical cancer, and it was to be hoped that, with the further development of radium therapy, surgery in this condition would ultimately be replaced by radium. Radium was of most service in borderline cases. In inoperable cases the use of radium had been more than justified, for by it was secured a lessening of pain and discharge, and, in some instances, the foul odor accompanying the disease had been entirely dispelled. Attention was also drawn to the value of radiation before and after operation, particularly in carcinoma of the breast. He then proceeded to discuss the technique of radium therapy. There were various methods of applying radium in order to bring it into contact with the tissue to be treated: (1) emanation tubes containing radium gas; these were buried in the tissues; (2) radium needles which also were buried in the tissues; (3) radium tubes, and (4) flat applicators. The slides which Dr. Aikins showed featured cases treated by all four methods and from these results one was justified in concluding that, to a very great extent, it was a matter of choice which type of applicator was used, as the ultimate effect was the same in most cases. However, in the experience of the speaker, skin lesions responded much more satisfactorily to the use of flat applicators than to any other type of apparatus, but tubes or needles were indispensable in the treatment of uterine conditions.

Very striking slides were shown which presented most convincing evidence of the efficacy of radium in the treatment of epithelioma, rodent ulcer, sarcoma, lupus, keloid, angioma, and other birthmarks.

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*Read at the annual meeting of the Canadian Medical Association, Winnipeg, June 21, 1922.

Case Reports

RETRO-CAECAL ABSCESS RUPTURING INTO BLADDER FOLLOWING COURSE OF RIGHT URETER.

DRS. WEBSTER AND HOOPER

Ottawa

Girl, age 25, was referred with diagnosis of stone in kidney.

Four days before admission to hospital was seized with sudden onset of sharp severe pain right side; cramps, nausea and vomiting; pain steady and severe. A few hours after began to pass blood per urethra, high fever, pain and haematuria persisted. Had to be given morphine by hypodermic injection.

Past history negative Always healthy, lost left eye at age of two years. Onset of menstruation age 14, every 28 days, no pain, no leucorrhœa, always regular. Last period ended two days before onset of pain.

Family history negative.

Examination: Patient looked toxic. T. 103; pulse 110; respirations 20. Heart and chest negative; tongue coated, dry; abdomen tender, rigid right side and back, mass right side. W.B. C. 14,000, 70 per cent. polymorphs. Was passing pus and blood. Kidney, ureter and bladder were x-rayed. Report as follows:—

"Kidneys negative, ureters negative; two small round shadows right side pelvic cavity, probably calcareous glands."

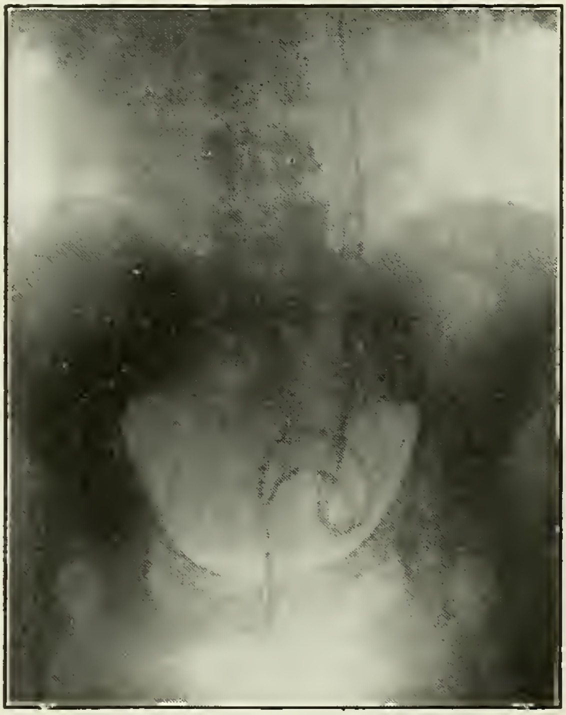
Cystoscopic examination made. Bladder was full of blood clots, fresh blood, foul smelling pus and mucous, even after many washings was impossible to distinguish anything. Patient was put on fluids, ice bag to abdomen, frequent bladder lavage and colon irrigation, general elimination treatment.

Gradually improved. In five days another cystoscopy was done. Bladder much better, still pus and blood. Mouths of ureters were visible; catheters passed readily to left kidney, a little difficulty in passing to right. Samples collected which were clear. Microscope, no pus no blood and sterile on culture.

Bladder lavage continued and patient markedly improved. Temperature and leukocytosis came down, but still pus in bladder.

Vaginal examination under anaesthetic revealed a normal pelvis. Specimens from each kidney again showed no pus, no blood. Catheters passed without difficulty, bladder still showed pus.

Patient was discharged from hospital in good health, except for the pus found in urine. Returned every week for examination and continued bladder lavage.



SECOND CATHETER POINTING TO RETRO-CAECAL ABSCESS

While washing out bladder with cystoscope it was noticed that pus seemed to come down from a small opening just to the right of mouth of right ureter. A catheter was gently pushed against it and it went on through. An x-ray catheter was inserted in right ureter and another up the sinus and a picture taken. Report of x-ray:—

"Two ureteral catheters in position of R. ureter to level of intercristal line. One continues on normally to level of II L. spine. Second catheter curves outward two degrees to one and a half degrees above iliac crest."

A diagnosis of a retro-caecal appendix which had ruptured into bladder along the course of ureter and thus drained itself.

Patient remained in hospital a few days, but was feeling so well, refused operation and so went home. On writing her attending physician she is reported in good health.

AN INFECTIOUS TYPE OF ERYTHEMA NODOSUM

Ward Woolner, M.B.,

Ayr, Ont.

Erythema nodosum is not an uncommon disease in country practice, but it is unusual for the disease to develop a well marked infectious character. In February, 1922, I was called to see a well-to-do farmer's wife, aged 35, who had always been in excellent health. I found her ill with a sore throat. Her temperature was 103°, pulse 120, while spread equally and symmetrically over both anterior tibial surfaces were about a dozen typical erythematous nodes. During the following week, similar nodes appeared over the whole anterior surfaces of both legs and arms, and a few were seen on the neck. Over two hundred typical nodes appeared in all. The patient was very ill. About a week after I had seen the mother, all the five children were taken ill with the same type of sore throat and with similar nodes on their shins. They were not so ill as the mother, nor had they more than a dozen nodes. The father was ill at the time with active pulmonary tuberculosis.

A young woman from another home was called in to help with the housework and two weeks later she developed the same disease. She was removed to her home and there a sister developed the condition within another two weeks. All recovered. This disease was probably due to a streptococcus infection finding its way into the system through the throat. The literature at hand has very little information about infectious erythemas. Symes, in 1907, in the *British Journal of Children's Diseases* reports an outbreak in a children's home in England during which thirteen cases occurred with one death.

Several writers have tried to show some connection between erythema nodosum and tuberculosis. It is interesting to note that in the first family the father had tuberculosis, but in the other family the writer could not find any trace of this disease.

ABSTRACT OF CLINICAL LECTURE ON TWO CASES OF TUBERCULOSIS OF THE SPINE

A. Mackenzie Forbes, M.D.,

Orthopædic Surgeon to Montreal General Hospital; Surgeon in charge of the Children's Memorial Hospital.

A. K., number 23/22, C.M.H., was six years of age when he was brought to this hospital. The complaint made was that he had difficulty in moving his left hip in walking. His parents had been fugitives from Bolshevist Russia. During the flight out of Russia the boy had fallen from the top of a load of furniture, and hit his back. On his way to this country he had been taken to a clinic in Antwerp where a tentative diagnosis of tuberculosis of the left hip was made. Shortly after reaching Canada, his parents had brought him to the Montreal General Hospital where a diagnosis of tuberculosis of the lower vertebræ was made. He was then sent to the Children's Memorial Hospital. In the examination after admission tuberculosis of the left hip was excluded as there was no atrophy of the muscles of the thigh; the glands in both groins were enlarged; while there was some limitation of extension at the hip, there was distinct spasm of the erector spinæ group of muscles, and there was no hypertonicity of the muscles about the hip. The patient's attitude also suggested a lesion in the spine. There was distinct scoliosis with convexity towards the right in the dorso-lumbar region and towards the left in the lumbar, sacral, and cervical regions, although there was no kyphosis. On flexion the spine was noticed to bend as a whole; hyper-extension of the spine was limited; also bending to the right was limited and gave rise to pain, whereas bending to the left was not limited. On X-ray examination no lesion of any vertebra was seen.

It was not difficult, however, to localize an inflammatory lesion on the left side of the spine. There was hypertonicity of the anterior abdominal muscles; spasm of the left erector spinæ group of muscles; spasm of the left ilio-psoas muscle and enlargement of the glands in both groins. Further, the spasm in the left erector group was greater than that in the right and the glands in the left groin were more markedly enlarged than those in the right; lastly, bending to the right was distinctly limited, and seemed to cause pain, whereas bending to the left was not limited, and did not cause pain. There was therefore, no uncertainty as to the position of the lesion in this child. Further, it was considered to be inflammatory and probably tuberculous in nature, because a Von Pirquet test had been positive, and the child's age suggested the probability of a tuberculous lesion.

Since the x-rays were negative, and since there appeared to be a definite inflammatory and tuberculous lesion the possibility of it being centered in the left kidney was considered and ruled out. A lesion of the soft parts covering the left side of the spinal column was deemed probable although tuberculosis of the retro-peritoneal glands could not be excluded. A tentative diagnosis of Pott's disease of the spine was made, and was shortly confirmed by a cold abscess appearing in the left inguinal region.

Case 2.—M. D., M. G. H., was twelve years of age when he was first brought to the out-door department of the hospital on July 18th, 1921, his mother complaining that he had been struck on the back by a base-ball bat. He was examined by one of the associate surgeons in the orthopædic department who found that there was a scoliosis with a convexity to the right in the lower dorsal region and that the left scapula was elevated and prominent. There was pain on lateral movement, especially to the left and some muscular spasm of the erector spinæ group of muscles, especially on the right side. An x-ray examination demonstrated no lesion of any individual vertebra, but a definite scoliosis in the dorsal region.

The patient unfortunately did not return to the clinic until November 30th, 1921, when he was brought to the hospital suffering from pain in the right lower quadrant of the abdomen. He appeared then to be desperately ill. His temperature was 102 and his pulse was much accelerated. There was definite tenderness over the right lower quadrant of the abdomen, and it was considered wise to admit him into the ward of the hospital for observation. Examined by the physician in charge of the ward a tentative diagnosis of miliary tuberculosis was made. He died on the tenth day after his admission into the hospital. An autopsy performed by Dr. Lawrence J. Rhea revealed miliary tubercles scattered profusely through the organs of the body; also two caseous tubercles in the cerebellum, and miliary tubercles and one conglomerate tubercle on the cortical meninges. There were a great many acute tubercles in the lungs and abdominal viscera. There were also tuberculous ulcers in the intestinal walls. These and the caseous tubercles in the cerebellum were older than the miliary tubercles in the other viscera. There was a very definite tuberculous lesion between and including the eleventh and twelfth dorsal vertebræ. This was considered to be the primary lesion. In the soft tissues covering the diseased vertebræ there was a small collection of tuberculous pus, but this had not extended beyond the site of the lesion.

On reading the history above one recognizes that the associate surgeon who examined him realized the probability that the child was suffering from an inflammatory lesion in the spinal column. In our clinics muscular spasm is recognized as the first symptom to appear and the last symptom to disappear in any form of arthritic inflammation. Spasm was demonstrated in this patient; lateral movement also caused definite pain and there was a scoliosis which had to be accounted for; scoliosis with muscular spasm and pain is rarely if ever present except from an organic lesion. The x-ray examination, however, apparently revealed no inflammatory focus in the vertebræ, only a scoliosis.

Is it possible to make a definite diagnosis of Pott's disease on the three symptoms mentioned: (1) Muscular spasm: (2) Pain on movement: (3) Scoliosis. While it may not be possible to make a positive diagnosis on such meagre information I cannot help feeling that these symptoms should be sufficient to make a tentative diagnosis. Muscular spasm, as we have said, is an important symptom of an arthritis. Pain on spinal movement is another symptom which must never be overlooked. Lastly, a scoliosis especially a scoliosis which might be described as of an acute angular variety, is not infrequently due to Pott's disease when the lesion is more of a unilateral than of a bi-lateral or central character.

The importance of making a diagnosis in a case of tuberculosis of the spine is necessarily great. A tuberculous arthritis demands rest, whereas if no arthritis is present and a scoliosis is the only symptom for which the surgeon is consulted exercises and forcible manipulations are often prescribed. The patient whose history has been briefly cited, died of a miliary tuberculosis apparently following Pott's disease. Would it have been possible to have saved this patient from this miliary tuberculosis by early treatment of the disease in the spine? This is uncertain; at the same time it is recognized that the number of cases of miliary tuberculosis which develop as a terminal affection in well treated cases of Pott's disease of the spine are extremely few.

Retrospect

HAEMORRHAGIC DISEASE OF THE NEWBORN*

Lionel M. Lindsay, M.D.,

Montreal

ALTHOUGH the various manifestations of this disease had been recognized for a long time it was not until 1911 that Schloss and Cummiskey[1] first attempted to separate those hæmorrhages which were purely symptomatic from those essentially spontaneous and due to no demonstrable cause. It is this last condition to which the name of hæmorrhagic disease of the newborn should be limited.

About the same time Lespinasse and Fisher[2] made the statement that on account of the sudden recovery with no convalescence, neither infection nor change in the capillaries could be considered an adequate explanation. The condition would appear, therefore, to be due to a change in the chemical composition of the blood.

Lucas[3] and others working on the physiology of the infant's blood, found that during the first four days of life there is a definite prolongation in the coagulation time. The appearance of hæmorrhage apparently depends on whether this peculiarity is exaggerated or not. During these early days the prothrombin element is also found to be diminished and as this element is derived mainly from the platelets one would expect a corresponding low platelet count. This however is not the case, although there is evidence to show that there are qualitative changes in the platelets. It is now generally accepted that the immediate cause of this disease is a lack of prothrombin or a loss of the prothrombin-antithrombin balance.

Rodda[4] has devised a simple clinical method for determining the coagulation time in infants. Briefly it consists in collecting one drop of blood in a clean watch glass containing a No. 6 lead shot. The end point of coagulation occurs when the shot is caught up in the fibrin and no longer rolls. This simple practical method only claims to detect gross variations from the normal range. By it Rodda was able to determine that coagulation normally occurs in from five to nine minutes in the newborn infant while in hæmorrhagic disease it may take fifteen minutes or more. Indeed, in several cases of melæna neonatorum it required even ninety minutes.

Duke[5] described a simple method for testing the bleeding time which is quite independent of the coagulation time. The ear is punctured with a sharp needle and the blood wiped up every minute by blotting-paper. Normally the bleeding ceases in from two to five minutes in the newborn infant but is much prolonged in those showing a hæmorrhagic diathesis.

In an investigation into the causes of death in stillborn and newborn children Warwick[6] found at autopsy that 50% showed intra-cranial hæmorrhages and in about half of these gross hæmorrhages were present in other organs of the body. Thus by far the more frequent cause of death in the newborn is cerebral hæmorrhage and this may occur quite independent of any trauma or asphyxia.

Rodda[7], of Minnesota, and Foote[8], of Washington, D.C., about the same time demonstrated the tendency to hæmorrhage in newborn infants is often first manifested as intra-cranial hæmorrhage. This is associated with delayed coagulation and prolonged bleeding time. They both strongly advise that blood coagulation tests be performed as a routine on all newborn infants, for by this means not only may the child's life be saved but permanent damage to the brain prevented by proper treatment.

Whatever the fundamental cause of this disease may be there is no doubt as to the best method of treatment. Human blood is the specific cure, in fact the only safe and efficient remedy.

Welsh[9], in 1911, first showed the value of subcutaneous injections of human serum and Schloss[10] the value of whole human blood given in the same way. Both of these methods have been found simple and adequate in mild cases. Usually 20 to 30 c.c. of either serum or whole blood should be given and the dose repeated two or three times.

Horse serum and various preparations of thrombin, while much inferior, may be used with benefit when human blood is not available. Gelatin and calcium salts are worthless.

In severe cases and especially if the infant is exsanguinated, transfusion is to be preferred. By this means not only is the defective element supplied to the infant's blood, but some of the blood lost by hæmorrhage is replaced.

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*Presented before the Osler Reporting Society, Montreal, March 24th, 1922.

It is now generally agreed that when possible agglutination tests should be performed as the serum of a small proportion of newly born infants contains agglutinins for adult corpuscles. Alan Brown and others[11] have shown that even the blood of a mother or father is incompatible in nearly 50% of cases. The fact that accidents so rarely happen from hæmolysis is largely due to the fact that iso-agglutinins and their receptors are not completely developed at birth.

The amount of blood it is safe to transfuse at one time is an important consideration. This is based on the blood-volume of the infant, which Lucas and Dearing[12] have shown varies considerably but averages about 15% of the body weight. From this it has been found that from 10 to 15 c.c. per pound of body weight is a safe yet effectual amount, if given slowly.

True hæmorrhagic disease of the newborn is a self-limited disease leading either to death or recovery in a few days. The use of human blood in the treatment has reduced the mortality from about 60 to 10 or 15 %.

The only sequela of any moment is an intracranial clot which demands early and radical treatment in order to forestall mental impairment, epilepsy or so-called Little's disease.

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A Study of Hypotension.—A consideration of the blood pressure records in 440 cases of absolute hypotension and 145 cases of relative hypotension suggests to Stewart R. Roberts, Atlanta, Ga., that hypotension seems to be equally distributed between the sexes. Hypotension patients have proportionately more normal hearts than have normal persons or hypertension patients. As the pressure rises the heart is more likely to be diseased. The pulse rate is not a determining factor in hypotension. It tends to rise only very slightly with rising pressure. The rate of the pulse is more dependent on the sex than on the blood pressure. Hypotension may accompany different diseases. It is difficult to prove the influence of the disease in the causation of the hypotension because, as a rule, the pressure before disease is unknown. The lowest pressures occur in secondary anemia, pellagra, somasthenia, neuroses, tuberculosis and the acute infections of the respiratory tract. Relative hypotension is a term that should probably be restricted to persons of 45 years and older whose pressure ranges between 111 and 119, both inclusive. The classification of hypotension is important because it separates hypotension in health from hypotension in disease and makes clearer the intricate problems of low blood pressure. Hypotension is not a bar to insurance in the old line companies, although in one series of 3,389 accepted candidates, the death rate was two thirds greater than the expectancy tables would indicate. Women seem to develop hypotension at an earlier age than men, as indicated by two series of cases. The percentage of the hæmoglobin is not a determining factor in hypotension. In disease of the circulation, secondary anemia is the most common accompaniment of hypotension. Arteriosclerosis and myocardial diseases are relatively rare. Focal infections are common accompaniments of hypotension. In sick adult negroes there are more cases of absolute hypotension than of hypertension. Hypotension seems to tend to accompany acute diseases characterized by fever and chronic diseases characterized by diarrhœas, as amebic dysentery, sprue and pellagra.—*Jour. Amer. Med. Association*, July 22nd, 1922.

Editorial

AURICULAR FIBRILLATION AND QUINIDIN

AURICULAR fibrillation is one of the commonest disturbances of cardiac rhythm. It may be of an acute and transitory character, superimposed on a relatively healthy muscle, but more usually it is associated with the impaired myocardium of rheumatic or arteriosclerotic hearts. In the early stages of fibrillation there may be little if any sign of lost compensation, and any means of restoring a normal rhythm should be of value in the treatment of these cases. While digitalis gives very striking results where chronic passive congestion is present, it has little effect on the auricular rhythm. It produces a partial blockage of the bundle of His, allowing a more regular action of the ventricles, but the auricles continue to fibrillate. In such cases the newly introduced drug quinidin may prove of service. In a certain proportion of cases it actually restores a normal rhythm to the heart as a whole. Lewis has shown that quinidin produces this effect by increasing the refractory period of the heart muscle, and so breaks up the aberrant waves of contraction which are passing through the muscles of the auricles, and allows the normal pacemaker to resume its control of the cardiac rhythm. These findings are confirmed by Cohn and Levy of the Rockefeller Hospital.

In its therapeutic use this result is not obtained in every case, but Oppenheimer in a collection of 462 cases from the literature finds the normal to be restored in 53.7 per cent. of the cases. In many instances the restoration is only of a temporary character, but Hamburger reports that in 27 per cent. of a small series it persisted for three or more months. It must be remembered that quinidin does not attack the cause of the arrhythmia, the tendency to fibrillation still persists, so that any mild infection or upset will often cause a return of the irregularity and call for further treatment.

With our increasing experience it has become evident that the drug has a definite toxic action. Levy has noted the following untoward effects: Headache, palpitation, gastric upsets, giddiness, diarrhœa, precordial pain and fever; any of which may appear during the exhibition of the drug. It may actually increase the degree of cardiac failure, and in about 20 per cent. of cases it sets up ventricular extrasystoles which call for a discontinuance of the drug. Collapse, embolism, and unexplained sudden death have also been noted, although Oppenheimer and Mann think that these dangers have been unduly stressed. The drug as a rule gives poor results in large hearts with multiple valve lesions, or in cases in which there is marked involvement of the myocardium, but seems useful in the more recent cases where the fibrillation is not due to some acute infection of the heart. It is given most effectively after a preliminary period of rest, after special dietary regulation, and after the heart has been thoroughly digitalized. The daily amount to be administered is from 1.25 to 2.0 gm. (gr. xviii–xxx.) divided into five equal doses, given at two hour intervals. The drug is to be continued until the rhythm has become regular, or until extrasystoles appear when it should be discontinued. It is generally regarded as wise to continue its administration in small doses (eg. 0.3 gm. daily) for some time after the initial course.

The success of any method of treatment should be judged not only by its action on the function of any organ or system but also by its effects on the comfort and efficiency of the individual. Is then quinidin only a scientific curiosity; a drug which while it chances to restore a normal rhythm to the heart, has little influence on the patient's efficiency? or is it a drug whose use is followed by a definite improvement in the functional capacity of the circulation? Present knowledge would indicate that quinidin helps a certain proportion of fibrillating hearts, lessens palpitation in many, and in a few actually sets up a regular rhythm, but in a majority of seriously embarrassed hearts its action, as yet, must be regarded as of doubtful value. All observers are in agreement that hospital observation is a necessity for safe treatment, associated with aid from the electrocardiograph when obtainable. At present the action of the drug is too uncertain to warrant its general introduction into private practice. Here digitalis must still continue to be our chief support in broken compensation and in cardiac arrhythmias.

D. S. Lewis.

INDUSTRIAL MEDICINE

EDGAR L. COLLIS in his retrospect of prehistoric history writes: "Industry may be considered as an outward and visible sign of the progress of human intelligence, and the mile stones along the road—the stone age, the bronze age, the iron age, the machinery age—gather additional interest when considered as stages in the evolution of mind. ...... The statement may be made that the intelligence of a race is measured by its industry, and that the primary *raison d'etre* of industry is safety and health. In other words, industry is the means that human intelligence employs to insure the existence of the race."

It is also apparent that one of the important issues of industry is the improvement of living conditions in the life of the race struggling for existence, and during the past two decades particularly, many industrial organizations in different parts of the world have individually developed important activities concerned with the comfort, happiness and health of their employees.

From the days of the knife factory operated by the father of Demosthenes with thirty slave workers to the beginning of the factory system in Italy in the 15th and 16th centuries, the transition in industry was tremendous; as remarkable, however, and of recent date is the appreciation by those who direct the policies of modern industrial organizations of the value of hygienic conditions in factories, and their recognition of the fact that industrial medicine is a good economical investment. It reduces time lost from illness and other causes of absenteeism, diminishes labour turnover, prevents accidents and generally safeguards the health of the workers; more important still, it advances the spirit of goodwill, loyalty and cooperation which are of essential and fundamental importance to the attainment of the fullest measure of success.

Furthermore, notwithstanding many labour saving devices the human machine is and will long continue to be the most important factor in the production of industrial wealth, and the medical supervision of all the conditions under which work is carried on is demanded in an increasing degree, not only in the interest of the manufacturing organization but also by humanitarian principles and by the laws of the land.

To further the value of such medical supervision courses of instruction in the various departments of industrial medicine have been established in several of the higher medical schools of the United States and in a few European countries, and there is a clear call for our Canadian universities, which have unusual responsibilities as well as opportunities in connection with this phase of medical knowledge, to undertake courses of special post-graduate training to enable young graduates to qualify for work in this field. It is to our medical faculties that business concerns should be able to turn both for advice and counsel relative to the development of such industrial medical service, and for adequately trained physicians to carry on such work on the most scientific lines. A certain amount of undergraduate instruction merits consideration as a means of stimulating the interest of students wishing to prepare themselves for a career in industrial medicine. University graduate courses should include the subjects of applied physiology, industrial toxicology, industrial operation, nutrition, industrial medical practice, industrial surgery, industrial medicine, vital statistics, and industrial sanitation. The value to the student of actual contact with the hygienic activities demanded in industrial establishments cannot be too strongly emphasized.

We consider it therefore desirable at the present time to emphasize the fact that industrial medicine is assuming a position of fundamental importance in the conservation of the human resources of the nation and offers opportunities to our universities further to contribute to the efficiency and happiness of present and future generations. B. L. Wyatt

CANADIAN OTO-LARYNGOLOGY

LIKE the other specialities "Oto-larngology" is of comparatively recent growth, but possibly chiefly from financial considerations, it is appealing to a rapidly increasing number of our younger graduates, and there is a danger that the high standing which the early methods of securing the necessary training entailed, will be depreciated by the present cheaper routes of travel to the desired goal.

The older specialists all obtained their post-graduate training in Europe—an expensive and prolonged experience—usually of three years duration. In the last quarter of a century, with the development of special clinics on this continent, the position of house surgeon to such a clinic for a year or eighteen months, or attendance upon one of the post-graduate courses in New York for a few weeks or months at the utmost, has provided a tempting short cut, and a large proportion of the younger "specialists" have never seen a foreign clinic, are ignorant of the problems to which their predecessors were presented, do not read the scientific special journals, and content themselves with removing tonsils and adenoids, and opening mastoids. Thus in Canada and the United States there has arisen a host of oto-laryngologists out of all proportion to the number of general practitioners, and greatly in excess of the relative number which exists in Britain or the continent. With this increase in numbers, the scale of preparation and scientific attainment, as well as the resultant scientific production has not kept pace. The leading societies of oto-laryngologists in America are aware of the danger, and are striving to set a higher ideal before the profession. The leading special hospitals are lengthening the period of residence for their interns; the universities engaging in post-graduate instruction are insisting that those who take special classes shall study to some purpose and for definite periods; thus the course in Minnesota is one of the three years, and the American Medical Association has appointed a representative committee to consider the question of the training of the specialist in all its bearings. In Britain a request has been made of the Conjoint Board to establish a Diploma in Laryngology and Otology obtainable by examination.

In Canada, outside of the University clinics in Montreal and Toronto, few opportunities exist for the training of the would be specialist. An interesting experiment is under way in the latter institution, where the Rockefeller gift has made it possible to arrange in this department for a graded course of four to five years, one of which must be spent in a laboratory. It would need, however, a number of such courses to provide adequate facilities for the Canadian profession, and until every large hospital in Canada bends its shoulder to the wheel, by establishing internships in this specialty, the Canadian who desires to become fully trained in oto-laryngology must seek foreign instruction.

While the training of the specialist has not been standardized in North America, and the average professional and scientific standing of these practitioners in the United States and Canada is of a lower grade than that of their confreres in Britain and most European countries, our universities in North America have recognized the necessities of their undergraduate students and have adopted a reasonable curriculum with compulsory examination upon the special subject as a part of the final examination, this examination to be conducted by specialists.

In over 50% of the class A colleges, instruction in oto-laryngology finds its separate place in the curriculum of the third and final years; in the rest the course is compressed generally into the final year. Instruction is confined to the anatomy and normal appearances of the parts concerned, familiarity with the head mirror and the use of the simpler instruments of examination, together with a knowledge of the pathological appearances of the more usual diseased conditions. It is generally recognized that the student has no call while an undergraduate to see operations, make differential diagnoses, etc., but by his ability to recognize the beginnings of evil to learn when to summon "special" aid.

In Canada we have established the principles of full departmental responsibility with education through two years of the course, compulsory attendance, and thorough examination by specialists, who have a reasonable quota of beds and clinics, a position only attained in Britain under the 1922 amended regulations of the Conjoint Board. If under-graduate teaching be limited along the lines laid down, it can never lead to specialization, or be reproached as trespassing on the time required for medicine, surgery and midwifery in an overcrowded curriculum. "What doctors need in their daily practice should be made compulsory." The student should be taught to recognize that an inflamed middle ear or nostril demands diagnosis and treatment to the same extent as a diseased heart or kidney. Thus only can the permanent deafness so common after aural and sinus affections be reduced, and a high mortality rate be avoided.

D. J. Gibb Wishart

Editorial Comments

A NEW MEDICAL QUARTERLY

A new quarterly journal entitled *Medicine* has made its appearance under the editorial direction of Dr. David Edsall, of Harvard, and Dr. John Howland, of Johns Hopkins Medical School, published by Messrs. Williams and Wilkins Co., Baltimore. It is intended as the medium of publication of critical reviews dealing with internal medicine, neurology and pediatrics. These will not be limited as to length and the editors hope to present articles of an authoritative nature covering the progress of medical science in a way not before attempted in any American periodical.

The first number sets a high standard of excellence and consists of two papers: The therapeutic use of digitalis, by G. Canby Robinson, and, The treatment of meningococcus meningitis, by Kenneth Blackfan. The first, which covers 127 pages, is a very full presentation of the pharmacology and therapeutics of digitalis. There are many references to the literature, but in the place of the usual bald statement of conflicting facts, the author presents an unusually good *critique* of the different findings, after the manner of the excellent critical reviews which appear at intervals in the English scientific journals. One cannot fail to be impressed by the sound judgment of the author, at once progressive and yet conservative. The article on meningitis also bears the stamp of the writer's association with what represents the best in American pediatrics. To many his remarks on intensive treatment will be a further stimulus in the management of the disease. His sturdy optimism in regard to the treatment of meningitis is required in view of the uniform lack of effect of serum treatment during the first years of the war. Active intrathecal serum therapy has a definite effect on the outcome of epidemic meningitis. Further numbers of the journal will be awaited with interest by an appreciative circle of medical readers

ORGANIZATION

"Organization is the correlation of all the forces and factors available in the establishment of a mechanism capable of producing the best results with a minimum of cost, wastage and friction."

In what way can this definition be applied to the medical profession.

Organization is the massing together of the medical profession intent upon studying the ways and means by which the profession can render the very best possible service to the community, at the same time establishing an *entente cordiale* in the profession which makes for greater harmony and mutual regard, thereby tending to eliminate all petty jealousies and malefactions; while, on the other hand, making it easier for the profession to meet with the public to better advantage and greater profit to both. T. C. R.

Treatment of Heart Failure.—In the treatment of failure of compensation, Starling says, rest is most important. It not only diminishes the demands on the heart from the arterial side, but by removing the main cause for the return of the blood to the heart it enormously decreases the inflow into this organ; and it is inflow which in the healthy heart determines output. The value of oxygen, when there is any cyanosis, is explained by its action in diminishing the blood pressure necessary to drive a sufficient amount of blood through the brain, the relaxation of arterioles and the improved supply to the vital organs of the body, and the direct effect of a proper supply of oxygen in improving the contraction and aiding the reintegration and recovery from fatigue of the heart muscle. The plethora attending failure of compensation is a reaction on the part of the organism, as a whole, not on the part of the heart, and does not assist this latter organ. It may, in fact, be harmful when the heart is beginning to recover under the influence of the other modes of treatment just mentioned. One can, therefore, understand the beneficial effects of bleeding as a preliminary measure in certain cases of failure of compensation, as well as the value of diminished salt intake. Another factor of importance in enabling the heart muscle to recover its physiologic condition is the circulation through the coronary vessels. Starling is inclined to ascribe the beneficial effects of graduated exercises in heart disease very largely to the improvement of the coronary circulation brought about by the temporary rise of arterial pressure accompanying the exercises. So important is the coronary circulation for the functional capacity of the heart that every medical men should be aware of the manner in which this circulation is regulated. The oxygen usage of the heart is directly proportioned to the work it does, and its oxygen supply must therefore vary within the same limits as its work, i. e., in a healthy heart from 1 to 7 or 10.—*London Lancet*, Dec. 10th, 1921.

Correspondence

ON THE DEVELOPMENT OF PROFESSIONAL INITIATIVE AND CRITICISM—A NOTE FROM THE WEST

To the Editor: Considering that Canada is largely an undeveloped country it is not strange that the dominant idea presiding over professional education is that practical men should be produced. Apparently these men have been produced; men at all events who have been able to adapt themselves to their environment, and who have satisfied their patients and clients. A practical attitude, however, is usually one of compromise; certainly it is so in politics, and in medicine it may tend to the acceptance of authoritative statements and formulæ as facts without sufficient individual criticism. Modesty and lack of self assertion have been stated to be faults met with in Canadians. They are characteristics which certainly would not be attributed to a Canadian by his detractors, but in medical science the Canadian profession is so dominated by the energetic activity and momentum of the profession in the United States and by the tradition and achievements of British medicine, that it lacks the arrogance to disagree with the statements made and sanctioned by one or other of these august and intellectual bodies. The attitude of the profession in the past has been one of docility and amenability to being taught. An excellent quality, no doubt, in children and in the ignorant; but in the adult it may imply an undue mental servility and an absence of that critical faculty to which the advancement of science has in the past been due.

Moreover, the rapid development of this country in the past few decades has appeared to many as owing more to the efforts of large organizations, such as railways, and incorporated companies, rather than to those of individuals; the average Canadian intellect as a rule considers that progress and security are dependent on these systems of power and authority and reacts against anything of a revolutionary nature, which might be subversive of stability. In politics he may be reactionary; in science or medicine he may be more critical; but on the whole his attitude is that it is hopeless to expect anything of value from mere individuals, and that all advance should be left to properly equipped laboratories, or organized institutions where thoroughly accredited heads are in command. May not this reliance upon or amenability to the opinion of others be carried too far? Let us, as a Canadian profession, develop a more critical and independent frame of mind. Let us prove all things, and hold fast only that which we find to be true. It is the members of our profession in their recognized associations who should set the pace in matters of public health and interest; of the numerous problems now filling pages of the Press, they should endorse only those which have a scientific or humanitarian aspect after calm and thoughtful discussion. The "Dope Menace" and "Total Prohibition" both demand an expression of opinion from our medical societies. We should neither remain silent or echo the exaggerated statements of well meaning but excited and hysterical persons. The would-be teacher who speaks or writes may be wrong in whole or in part, notwithstanding an appended list of authorities. For the development of this spirit of constructive criticism it would be well if the Journal reserved one or two pages in each issue for short concise letters from its readers. J. E. C.

Vancouver, August 25th, 1922.

Drug Therapy in Pyelitis.—An attempt was made by Henry F. Helmholz, Rochester, Minn., to determine the direct mode of action of several of the more commonly used drugs in the treatment of pyelitis. The action of the alkalis, of hexamethylenamin and of salol has been studied. In acute cases of pyelitis, the alkalis are useful, but there is no evidence of any direct specific action. Hexamethylenamin has a very definite bactericidal action in the bladder, but whether this applies also to the pelvis of the kidney has not been demonstrated. Phenyl salicylate does not have antiseptic properties in the doses given. *Jour. Amer. Med. Association*, July 22nd, 1922.

Abstracts from Current Literature

SURGERY and ANÆSTHESIA

The Treatment of Perforated Gastric and Duodenal Ulcers. Southam, A. H. *Brit. M. J.*, April 8th, 1922.

The writer bases his paper on a series of forty-six cases—forty were duodenal or pyloric, five gastric, one gastro-jejunal. Thirty-four patients with duodenal ulcers were operated on within 24 hours after perforation and all recovered, the remainder died from shock. Of the five gastric ulcer cases. two died subsequently from pulmonary complication. The mortality was 8.7%. After treatment, Fowler's position is adopted on return to the bed, rectal salines are given, the stomach is kept at rest as far as possible in order to give an opportunity for the ulcer to heal.

After discharge, a careful diet for six months. Sodium bicarbonate is given to diminish any tendency to hyperacidity, and defective teeth are attended to.

The earlier the operation after diagnosis the better the prognosis.

There are certain types of perforating ulcers commonly found in the duodenum which, when put at rest by infolding and suture combined with careful diet and rest, will heal. Under those conditions it is better to leave the stomach in its natural condition without the complication of a gastro-enterostomy. If the ulcer should subsequently prove to be of the unhealable type, a gastro-enterostomy can be performed later. In a large proportion of the cases a gastro-enterostomy does not appear necessary.

B. F. MacNaughton

Splenectomy in Banti's Disease, Third Stage. Fisher, David. *Surg. Gyn. Obst.*, August, 1922.

The author briefly discusses the therapy of splenectomy, quoting articles by W. J. Mayo abstracted previously in this Journal. It is apparent that cases operated on in the third stage have not been reported often enough to afford definite conclusions. Where ascites, liver cirrhosis, intense jaundice and enlarged spleen exist the patient is doomed, but an operation offers a fighting chance as proven by occasional cures following splenectomy. In the last twenty years, Sweetser was able to collect only forty-two cases where this was done in the third stage of Banti's disease, or in diseased conditions of undetermined etiology. The mortality was 26.5% giving the patient three chances out of four. Fifty-five per cent. of those who survived operation, lived and enjoyed good health for more than fifteen months and may be considered to be cured. Spleens removed show hypertrophy of the connective tissue and thickened adherent capsule; the pulp and Malpighian bodies are atrophied, and surrounded by dense fibrous tissue. Splenectomy results in fewer organisms in the bile following operation, stimulates all lymphatic tissue, increases the resistance of the red cells, rendering them less fragile, causes a loss of iron from the body, though less in chronic than in acute conditions. The first case splenectomized for Banti's disease (Cushing) is alive twenty-three years later, though occasionally he has an attack of hæmatemesis. The two cases reported were Banti's disease; one recovered, one died a few hours after the operation. Both cases showed a three or four plus Wassermann which is almost constant in this disease, and exists in many cases of jaundice in spite of intense antisyphilitic treatment.

Charles K. P. Henry

Intra-Cardiac Injections (Les Injections Intracardiaques.) Cheinesse, L. *La Presse Medicale.*, Oct. 22 1922.

L. Cheinesse quotes a paper by J. Winter published in 1905 on the results of experiments made with adrenalin in animals, whose breathing and pulse had stopped during chloroform anæsthesia. He found that the injection of a solution of adrenalin into the left ventricle either directly through the chest wall, or after uncovering the heart, started the heart beat, whilst other measures such as adrenalin given intravenously had no such effect.

Winter suggested that this measure should be employed upon human beings in cases of apparent death under chloroform.

Latzko about the same time reported three cases in which he had made such injections. In one of them, a case of perforative peritonitis, pulse and respiration having stopped, he injected adrenalin into the left ventricle. Cardiac pulsations began again, the patient was able to speak but death took place in an hour.

Modern physiological research, confirmed by clinical observation, shows that there is a definite space of time between the apparent and the real death of the heart. Intracardiac injection is the most effectual means of starting the heart beat during this interval, but it must be done while the heart is still irritable and before the brain has suffered irreparable damage, a period of at the most ten minutes.

Cheinesse considers intracardiac injections indicated not only in collapse during chloroform anæsthesia, but in asphyxia, in collapse from hæmorrhage, in traumatic shock, electrocution, and in sudden cessation of the heart beat during operations on the heart, in asphyxia neonatorum, in sudden heart failure in disease of the heart or arteries and in infectious diseases.

Schulze is quoted as saying that intracardiac injection is in no way dangerous and causes no bad after effects. He suggests this method as suitable for obtaining a rapid effect from strophanthus and digitalis, where it is impossible to use a vein.

The technique is simple. After sterilizing the skin with iodine a fine needle measuring 10 c.m. in length is introduced into the fourth left intercostal space one or two fingers breadth to the left of the sternum. The needle is pushed in gently with a slight inclination towards the median line. At the same time gentle attempts at aspiration are made with the piston. At a depth of 3½ to 4½ c.m. one ceases to feel the resistance of the tissues and at the same time one can aspirate blood.

Adrenalin seems to be the most suitable drug to inject. Camphor, caffeine, and preparations of digitalis have been used. Of fifteen successful results collected by Vogt, nine were obtained with adrenalin. W. D. Howell

The Indications and the Dangers in the Use of Spinal Anæsthesia in Obstetrics, Gynæcology and Abdominal Surgery. Huggins, R. R. *Am. J. Obstet. and Gyn.*, April, 1922.

The writer points out that a certain number of deaths occur suddenly on the table from all forms of general anæsthesia. The percentage depends on the skill of the anæsthetist and of the surgeon. There are deaths occurring after the patient leaves the operating room with which the anæsthetist has much to do. The stimulating effect of ether as evidenced by the flushed face, rapid respiration with consequent over ventilation, the quick pulse and sweating, produce a condition of exhaustion. Especially is this the case where the anæsthetic is taken badly and there are also cyanosis, laboured breathing and rigid muscles. Loss of fluid from post-operative vomiting aggravates the condition.

In spinal anæsthesia, on the other hand, the blood pressure falls, respiration is slow and the skin warm and dry. The heart is rested, instead of being overworked. Mental distress can be prevented by the preliminary use of scopolamine and morphine. The abdominal muscles are relaxed and there is no straining. As a result of low blood pressure there is less bleeding and troublesome oozing. The patients are in better condition immediately afterwards and make a quicker recovery.

The writer considers that spinal anæsthesia is especially indicated in severe pelvic infections with dense adhesions, in fibroid tumours where the heart and entire musculature are weakened as a result of toxæmia and hæmorrhage, in chronic gall bladder conditions, in obesity accompanied by fatty degeneration of the heart, in the early stages of acute spreading peritonitis and in pulmonary tuberculosis and asthma. He considers the method dangerous where there are permanent changes in the arterial system which interfere with the normal elasticity of the arteries and in general where the blood pressure is very high or very low. It is also contraindicated in patients desperately sick as in general peritonitis and in severe shock.

Two fatal cases are cited. One was a case of eclampsia where cæsarian section was to be performed. A convulsion took place immediately after the introduction of the anæsthetic. Respiration stopped suddenly. He thinks the death was due to the sudden change in the cerebrospinal fluid, the anæsthetic being carried up the spinal canal to the medulla.

Huggins therefore considers that spinal anæsthesia is contraindicated in the presence of convulsions.

The second fatal case was a patient desperately ill with a severe puerperal infection. The blood pressure was only eighty before blood transfusion raised it to ninety. After the injection it, fell rapidly and steadily without any response to stimulation.

The writer uses novocaine. He gives 2 c.c. of an 8% or 10% solution which has been trebly distilled. To this are added 4 m. of absolute alcohol. The solution is made freshly and boiled before introduction.

In some of the cases headache followed and this was found to be due to the use of distilled water which had been contaminated from a defective still.

Two hours before operation a hypodermic injection of scopolamine gr. 1/200 and morphine gr. 1/8 is given. Thirty minutes before another eighth of a grain of morphia is given. The patient's ears are plugged with cotton and he is blindfolded. W. D. Howell

MEDICINE

An Additional Contribution to the Symptomatology of Epidemic Encephalitis. Kennedy, Davis and Hyslop. *Arch. Neurol. and Psych.*, July, 1922.

This article embraces a contribution to the late symptomatology of encephalitis lethargica and enriches our present knowledge of the widespread clinical incidence of this disease.

The cases are grouped under the following headings: 1. spinal types; 2. disturbance of metabolism; 3. disorders of motility and 4. disorders of the vago-sympathetic mechanism.

Under spinal types are noted cases, manifesting, not only affections of the ventral horns and evidence of transverse softening of the cord, but, also, an entire new symptom-complex—that of syringomyelia.

Metabolic disturbance is becoming more evident and cases are cited to illustrate temporary disorders in the vegetative system. Increase of body weight, excessive thirst, polyuria and, occasionally, glycosuria with diminished sugar tolerance were noted.

Under disorders of motility, our attention is drawn to such symptoms as stammering, rhythmic movements, breathing irregularities and eccentric station, as evidence of disturbance in the toning mechanism.

The final vago sympathetic-group—is characterized by first; a strongly positive oculo-cardiac reflex-ocular pressure, in one of these cases, stopped the pulse for twenty-eight seconds, following relief of pressure; and second, by exophthalmos, which was observed in twelve cases.

As a result of their investigation in the drug therapy of epidemic encephalitis, which the authors believe should be directed toward the vegetative nervous system, the following observations are recorded:

1. Thyroid and pituitary substances have no effect on the residual encephalitic symptoms.
2. Epinephrin increases the pulse rate by 50% and increases the rigidity for several hours after administration.
3. Atropine, in large doses, increases the rigidity and makes the patient subjectively worse.
4. Scopolamin, in doses of 1/100 grain three times daily by mouth produced a lessening of the rigidity in one-half the cases in which it was employed. It restored facial mobility and rendered the patient more comfortable.
5. Gelsemium—the fluid extract—in doses of 7 minims, three times daily, had a very similar effect to that of scopolomin and the effects persisted so long as the drug was used.

The conclusion arrived at is that, in scopolamin and gelsemium, we have our most useful drugs in relieving the rigidity and discomfort associated with the late residual effects of encephalitis. Of these, gelsemium is more advantageous in that it can be used indefinitely and is free from the dangerous effects, of a cumulative nature, sometimes associated with scopolamin. F. H. Mackay

The Constitutional Symptoms of Tuberculosis. Krause, A. K. *New York M. J.*, April, 1922.

The author lays stress upon the importance of making a diagnosis in tuberculosis as to the *activity* of the infection. The constitutional symptoms are equally important for prognosis and diagnosis as they result from a poisoning which develops from the absorption of materials from tuberculous foci. This intoxication is probably a non-specific process induced by the absorption of material from the foci in a large enough quantity to produce the symptoms. These materials are from the *cell elements of the tubercle* rather than from the bacilli. The constitutional symptoms referred to are evidenced by fatigue after normal strain, over-irritability, with consequent disturbances of circulation and digestion, fever, with an unusual daily range of temperature, malnutrition and loss of muscular tone. Acute constitutional symptoms imply re-infection.

The author concludes that under conditions of complete physical rest, mild tuberculosis takes care of itself. C. F. Martin

Some Abuses of Cathartics. Baggott, B. H. *J. S. Carolina M. A.*, April, 1922.

The writer deprecates the indiscriminate use of purgatives, especially at the onset of all diseases, more especially in obscure acute abdominal conditions. Thus, for example, in appendicitis the use of purgatives hinders nature in its efforts to wall off an abscess and may induce peritonitis. Ochsner is quoted as saying that in thirty years of practice, he has never had a diffused peritonitis except where a cathartic was given.

Again, the use of purgatives in purulent diseases of the gallbladder and bile passages is also held to be unwise. The same is true in cases of intestinal obstruction, duodenal ulcer, gastric ulcer and typhoid fever.

He further makes the interesting suggestion that in chronic constipation, the use of cathartics merely results in depressing the neuro-muscular mechanism of the intestine, which should, on the other hand, be improved by means of diet, exercise and general regimen and habits. C. F. Martin

The Use of Tuberculin in General Practice. Baemeister, A. *Müch. Med. Wochenschr.*, April, 1922.

The author advocates tuberculin treatment in all cases of mild tuberculosis, especially those with a subfebrile course. Tuberculin is especially useful in mild forms of ,glandular, osseous or cutaneous tuberculosis, as well as in those affecting the genito-urinary system and the eye. Wherever the condition is mild and chronic and without sign of progression, the results are held to be excellent. On the other hand, tuberculin should not be used when the process is progressive and exudations are obvious. For such cases as are favourably susceptible to the use of tuberculin, he recommends the additional use of heliotherapy, moderate exercise in the open air, but not necessarily over-feeding or rest.

Tuberculin is justifiable in chronic ulcerative tuberculosis only where the condition seems to be stationary or very slightly progressive towards fibrosis. He recommends the use of Koch's old tuberculin where a strong focal reaction is required. Where, however, a severe reaction should be avoided, he prefers the new tuberculin bacillus emulsion. While it is impossible to establish any definite rule-of-thumb for the use of tuberculin, he deprecates the newer inunction and vaccination methods of Petruschky and Poundorf as being dangerous because there is a fear of inaccurate dosage and the absorption of too much of the tuberculin.

In using the old tuberculin, the author begins with 0.0000001, and increases progressively to 0.0000003, 0.000 0006, 0.000001, giving two or three injections a week and avoiding severe reactions. The interval between the injections depends on the reaction of the dose. Many months are necessary before one can be satisfied as to the beneficial effects of the treatment, and its continuance depends upon the improvement of the patient. C. F. Martin

Cure of Early Diabetes Insipidus After Lumbar Puncture. Tucker, J. *Am. J. M. Sc.*, May, 1922.

The writer's experience in one case suggests that the withdrawal of spinal fluid may be of advantage in some cases of early diabetes insipidus inasmuch as, twenty-four hours after the operation, relief of the symptoms was obtained and remained permanent for five and a half months.

The patient's symptoms were increased thirst, polyuria, and sweating; and examination of the nervous system showed involvement of some of the cranial nerves on the left side.

Tucker recorded the condition as one due to a serous meningitis with œdema of the infundibulum cerebri and involvement of the cranial nerves. It would seem that in this case the diabetes was associated with an obstruction of the flow of the normal secretion due to transient œdema of the pituitary gland, or to some extra-pituitary condition which caused increased intracranial pressure, and perhaps some exudate outside of the pituitary body. C. F. Martin

Sudden Death and the Endocrine Glands. Olbrycht, J. *Polska gaz. lek.*, March, 1922.

It is not an infrequent experience to find clinically unexplained sudden deaths where the autopsy reveals some lesion of the endocrine glands, most often, perhaps, of the adrenals. Sometimes, indeed, no explanation is found. The occurrence of sudden death in the status thymicolymphaticus is well recognized, and many cases have been described. One usually finds at autopsy in these cases abundance of subcutaneous fat, pale skin and general enlargement of the adenoid system. It has been thought that in some way hyperactivity of the thymus has been the cause of death, but the conclusive evidence is still wanting.

Among the various changes in the endocrine system which were found in the autopsies on these cases were the following:

Malformation of the suprarenal gland, especially its medullary substance, with decrease in the chromaffin cells, and atrophy; degeneration of the thyroid gland, alteration in the development of its epithelial secreting structure, etc. It is recognized that an antagonism exists between the thymus and the chromaffin system, the thymus having an inhibitory effect upon the sympathetic nervous system, while the chromaffin system has a stimulating action. Sudden death, it is presumed, occurs as the result of hyperthymization from insufficiency of the chromaffin system. This explanation is but a part of the pathogenesis.

Death from disease of the adrenals is not only more common but more easily explained. If the medullary substance is destroyed, death takes place. A proof of this has been frequently observed in death following severe hæmorrhages in the adrenal occurring in the course of various infectious diseases. The significance of the other endocrine glands is as yet unexplained, but it would seem that the extensive destruction of any of the vital glands of the endocrine system may explain sudden death where no other etiological factor is apparent. C. F. MARTIN

The Practical Significance of the Alimentary Hyperglycemia Curve.

Rosenberg, Max. *Klin. Wochenschr.*, Berlin, February, 1922.

It is now well recognized that glycosuria does not necessarily result from an excess of sugar in the blood, and that even with normal kidneys, the glycosuria is independent of the amount of blood sugar.

In normal individuals the author found that the experimental blood sugar rose to twice the normal without sugar appearing in the urine, and that only after excessive amounts of grape sugar had been taken was there any glycosuria.

On the other hand, he introduced dextrose by rectum, avoiding the liver, and found that glycosuria appeared on slight hyperglycæmia. The important point was that by introducing the dextrose through the rectum, the liver *was* avoided showing that when sugar passes through the liver, it becomes of a certain nature characteristic for the organism. Evidence of this fact is adduced from a case of illuminating gas poisoning, in which the blood sugar was twice the normal while there was no glycosuria, but after injecting a certain amount of grape sugar, there was glycosuria with an even lower hyperglycæmia.

Testing for alimentary hyperglycæmia is, therefore, of great use in diagnosis, especially in elderly people, when latent diabetes may be present, when, as happens in such cases, the kidneys do not react to the stimulus of the increased blood sugar, and, therefore, no glycosuria is shown. In other words, alimentary hyperglycæmia testing may show changes of the carbohydrate metabolism, which cannot be found by any other means. C. F. MARTIN

The Use of Sulphur in the Treatment of Chronic Deforming Joint Diseases.

Meyer-Bisch, R. *Berlin Klin. Wochenschr.*, March, 1922.

The use of sulphur is compared with that of proteins. It is a non-specific reaction of the normal and diseased organism to the injection of proteins and chemically-active bodies.

Apparently the injection of sulphur induces a decrease of chondroitin sulphate in cartilage and catabolism of specific cartilage substances. It is for this reason that the sulphur has been recommended. Injections of sulphur induce leukocytosis, which may be used as a standard of dosage. Leukocytosis occurs even after 3 c. c. of a 1-1000 solution. The general symptoms are no greater than those after injections of milk. 1 gm. of sulphur in 100 gm. of olive oil may be used as a strong solution, while 1/10 of that solution may be used as a minimum dose. It is well to begin with weak solutions, not more than 5 c.c. of a 1-1000 solution injected into the musculature of the buttocks. If no reaction occurs, a stronger solution may be used after one week's interval. If after two days there is evidence of an improvement in the joints, one may use passive movements to assist the cure. Two further weekly injections of 5 c.c. of the weak solution will probably suffice in mild cases, and if the case be more severe, an additional injection may be given, and the treatment may be repeated after an interval of several months. Cases are reported in which manifest improvement has occurred.

C. F. MARTIN

The Recognition and Treatment of Minor Degrees of Fibrositis.

Marlin, T. *Brit M. J.*, April, 1922.

The writer believes that very many cases of obscure muscular pain, stiffness and signs of resistance in the soft tissues of the body are due to definite fibrous thickening. With care, these thickenings may easily be palpated. Many conditions of illness are, he believes, associated with this pathological change. He enumerates many other symptoms arising in this way; headaches, associated with indurations in the upper fibres of the trapezius; flatulent dyspepsia, associated with fibrous strands in the erector spinæ muscles. Cases of this kind are readily treated successfully by means of massage and manipulation.

The writer's statements are of interest in view of the importance of proper medical guidance in the use of massage, which would so often obviate the necessity of patients consulting the irregular practitioners and finding relief at their hands.

C. F. Martin

The Cranial Hyperotoses Produced by Meningeal Endotheliomas. Cushing, Harvey. *Arch. Neur. and Psych.*, August, 1922.

In a series of over one thousand presumptive cases of brain tumour, the lesion was verified in 748 instances. The endotheliomas represented 10.7 per cent. of these cases and occurred in the ratio of one to four of the gliomas.

Of the eighty endotheliomas, twenty were accompanied by a recognizable thickening of the overlying bone. For reasons not as yet entirely clear, endotheliomas *en plaque* are more likely to provoke bony thickening from tumour invasion than are the large rounded tumours. The hyperotosis, which is either palpable externally or demonstrable by the roentgen ray, is due to invasion of the bony canals by tumour cells, with resultant stimulation of osteoblasts and the production of new bone. G. S. Mundie

Spinal Drainage Following Intravenous Arsphenamine. Craig, C. B., and Chaney, L. B. *J. Nerv. and Ment. Dis.*, August, 1922.

Of twenty-five cases of syphilis of the nervous system treated with intravenous arsphenamine followed by spinal drainage, of which only tabetic and paretic cases are cited, the writers come to the following conclusions:

1. No single method of treatment is applicable to all cases. 2. The intravenous administration of arsphenamine is the method of choice. 3. Spinal drainage after intravenous administration of arsphenamine is not a hazardous procedure. 4. Drainage will benefit some cases which have arrived at a position of inertia under intravenous administration alone. 5. As satisfactory clinical and serological results may be obtained by intravenous arsphenamine and drainage as are produced by the intraspinous method and without the severe root-pains frequently set up by the latter method. G. S. Mundie

Xanthochromia Due to Acute, Purulent Spinal Meningitis. Horrax, Gilbert. *Arch. Neurol. and Psych.*, July, 1922.

This is the report of a case of purulent spinal meningitis, manifesting a xanthochromatic fluid which differs from the classical xanthochromia of Froin, in the absence of spontaneous clotting.

The typical xanthochromatic fluid of Froin is characterized by its yellow colour, spontaneous clotting, high globulin content, variable pleocytosis and absence of positive tests for hæmoglobin.

It is a compression syndrome, determined by the isolation of a cul-de-sac in which the fluid stagnates and is generally considered a result of tumour or gumma of the cord.

The case cited by the writer, in which full clinical and autopsy findings are given, presents a further causative factor in the production of this syndrome, namely, purulent meningitis, though, as is suggested by the writer, the probability of the formation of a cul-de-sac with similar effect, is borne out by the extensive exudate formation about the cord and the absence of any discoverable organisms in the fluid.

F. H. Mackay

Some Conditions Controlling Internal Secretions. Cannon, W. B. *J. A. M. A.*, July, 1922.

In this article the author presents a concise summary of the known physiological facts bearing upon the interrelation of the internal secretary glands and their position in the physiological activity of the organism. While admitting the obvious influence that the internal secretions have upon bodily function, such as growth, proper development, sex character and metabolic activity, he clearly points out that they are not the central generators in such activity but that they, too, are dependent upon physiological control in the healthy normal organism. In the government of the personality and of metabolic activity, he does not hold that the seats of the mighty are occupied. solely. by the endocrine glands but, rather, that they play a secondary role—controlling and being controlled—in the maintenance of normal physiological activity.

Evidence. both physiological and experimental is presented to show the influence of the vegetative nervous system upon the endocrine system. Three glands, at least, the suprarenal medulla, the liver and the thyroid have been shown to respond in increased secretory output, to stimulation of the splanchnic nerve while, coincidently, these same organs are known to respond in like manner to such influences as pain, asphyxia and emotional excitement, acting, as has been shown through the medium of the splanchnic nerve.

The effect of rage, fear and anxiety, in producing an increased output of epinephrin, hyperglycæmia and glycosuria and the effect of stimulation of the cervical sympathetic in increased thyroid activity are clearly shown.

Evidence that the posterior lobe of the pituitary is also influenced by nervous impulses is probable but less authentic while there is little authority for placing the pancreas (islet-cells) in this category. That the suprarenal or thyroid can continue to function after their control nerve is severed is no proof that they are independent of nervous control any more than that the heart which continues to beat after the vagus is severed is an independent organ.

Some interesting conclusions are drawn on the theory of vagotonia which has come to be accepted in medical literature as a real condition. Eppinger and Hess, the authors of this theory, conclude that the entire vegetative nervous system is under the control of the internal secretions but Dr. Cannon not only relegates this conclusion to the realm of theory but clearly points out the impossibility of its acceptance. He shows that the anatomical distribution of the two great divisions of the vegetative nervous system viz: the sympathetic and autonomic are essentially different. The sympathetic system is arranged for diffuse and wide-spread activity and is amenable to stimulation by a chemical agent such as epinephrin and, indeed, is brought into activity as a whole by such stimulation as is evidenced in the simultaneous dilatation of the pupil, rapid heart action, vasodilatation and hypo-motility of the stomach and intestines.

On the other hand the autonomic system is arranged anatomically to act in independent parts. A contracted pupil, effected through stimulation by light, of the cranial autonomic, is not necessarily accompanied by slowing of the heart or hyper-motility of the intestine as there is no conceivable need of the organism that could call for such a combination.

The sympathetic is diffuse and general and, as such lends itself to the influence of epinephrin. The autonomic is independent as to its several parts, both in anatomical distribution and function and cannot be influenced as a whole, by any chemical agent while, in fact, no such agent has ever been found except in the imagination. Hence, while the term—sympatheticotonia—is permissable in the light of present known facts. the opposing state—vagotonia—is an unknown quantity and without any foundation of fact.

The second part deals with the other endocrine organs, the testis and suprarenal cortex which are known to be devoid of nerves, and evidence is produced to show that the activities of these organs are influenced by agents reaching them through the blood stream—the humoral control.

In dealing with the evidence bearing upon the inter-relation of the various ductless glands, he states "all is a maze of complex possibilities, contradictory reports and uncertain inferences."

While it is known that growth may be influenced by several glands, namely, the anterior lobe of the pituitary, the thyroid and the gonads: that reproduction depends not alone upon the gonads, but also upon the suprarenal cortex. the thyroid and the pituitary: that carbohydrate metabolism is controlled by the pancreas, liver, thyroid and pituitary, yet. it is not at all clear what these inter-relations are or how one organ may affect the other.

The only conclusion that present authoritative evidence can support, is that there is an inter-relation and inter-dependence between the various glands of the system and that, as a group, the ductless glands are not self-sufficient but govern and are governed in common with all other bodily tissues that go to make up the complete physiological unit. F. H. Mackay

Suture of Severed Median Nerve With Rapid Recovery of Function. Wirth, Edgar. *Brit. M. J.*, 2:900, November 26th, 1921.

This is the record of a case of rapid recovery of the median nerve following suture. The nerve was accidently severed in the arm and at the time of operation the following findings were made:

1. Complete loss of voluntary movement in all the muscles supplied by the nerve.

2. Complete sensory loss to all forms of sensaion in the entire median distribution.

End to end approximation was done and the nerve sutured with chromicized catgut. The brachial artery was ligated at the same time.

Two days later, evidence of recovery was noted in better flexion at the wrist joint and some degree of abduction of the thumb.

Six weeks later, voluntary power had returned in all the muscles of supply and sensory loss was much less extensive.

Five months after the operation, the only weakness, noticable in voluntary power, was in flexion of the distal phalanx of the thumb and index finger. Sensory loss now involved only the index finger. No electrical reactions were recorded F. H. Mackay

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The Intradermal Reaction in Experimental Tuberculosis.—Debré and Bonnet (*C. R. Soc. Biologie*, March 4th, 1922) bring forward evidence to suggest that the local reaction of the guinea-pig to an intradermal injection of tuberculin—the animal having previously been infected with living tubercle bacilli—varies more or less directly with the resistance of the animal. They find that a dose of 0.5 mg. of living tubercle bacilli determines the death of a guinea-pig weighing 400 to 500 grams in five to seven weeks, that of one of 500 to 600 grams in ten to fourteen weeks, and that of one of 700 to 800 grams in sixteen to seventeen weeks. Also the that local reaction and the swelling of the lymphatic glands draining the site of injection are more pronounced in the heavier than in the lighter animals. Further, in the heavier animals the health remains good till just shortly before death, while in the lighter ones there is a progressive loss of weight almost from the start. At autopsy the former animals are found to have a local lesion in process of cure, marked regional lymphatic swelling, large tubercules in the liver and spleen, and a confluent bronchopneumonia; in the latter group, however, the local and lymphatic lesions are minimal, while a generalized tuberculosis is manifest throughout the body. Now, if intradermal reactions be made on infected guinea-pigs of varying weights, it is found that the intensity of this reaction is directly proportional to the intensity of the local reaction following the injection of the bacilli, and that the persistence of the intradermal reaction is longer in proportion as the weight of the animal is heavier. These results are in close accord with what is found in human infants. In weakly, poorly nourished infants the evolution of tuberculosis is accompanied by a progressive loss of weight and a practical failure to respond to the tuberculin reaction, while in healthy, breast-fed infants fever persists to the end and the tuberculin reaction is very marked.—*Brit. Med. Jour.*, June 3rd, 1922.

The Demand for Vitamins.—In spite of the fact that ordinary fresh foods are the simplest, cheapest and richest sources of vitamins, the public apparently demands to be supplied with vitamins in the form of medicinal products.

The public "demands" vitamins in pill form! Why? For the same reason that the public, lay or medical, demands many things today that it does not need— because the whole trend of modern advertising is toward creating demands, rather than supplying needs. Vitamin concentrates are being "demanded" by the public because shrewd and forward-looking "patent medicine" exploiters are using all the subtle arts of modern advertising to convince the public that it is in serious danger of vitamin starvation, and that the only hope lies in buying these alleged concentrates to make up a hypothetical deficiency. It seems inconceivable that a rational man would pay a tremendously high price for certain food factors which are already present in his ordinary diet. But he will; and advertising is the reason. Advertising campaigns such as these of the vitamins constitute a vicious circle; an artificial demand is created and then the manufacturer excuses his business on the ground that he is merely supplying a demand! As our British contemporary says, "ordinary fresh foods are the simplest, cheapest and richest sources of vitamins."—*Jour. A.M.A.*, March 18th, 1922.

News Items

ONTARIO

Meetings of many County Societies in Ontario took place during July, the notes of which were unfortunately received too late for publication last month. During August the following Societies held interesting meetings at all of which a good attendance was reported.

The Haldimand County Medical Society met at Dunnville on August 10th, and was addressed by Dr. R. G. Armour of Toronto, his subject being "The Diagnosis of Lesions of the Spinal Cord."

At the meeting of the Northumberland and Durham Medical Societies at Brighton on August 23rd, Dr. R. D. Rudolf of Toronto, spoke on "System in the Care of the Sick."

On August 24th, the Lambton County Medical Society met at Sarnia. The interpretation of signs and symptoms of chronic gastro-intestinal disease was discussed before the Society, by Dr. F. W. Rolph of Toronto.

The Directors of the O.M.A. announce that, owing to the munificent grant of the Ontario Division of the Canadian Red Cross Society, and the healthy financial condition of the Association, it has been decided to provide each affiliated Society in the Association with eight lecturers free of cost during the coming year.

The Committee on Education of the Ontario Medical Association will shortly issue a new Post Graduate Schedule covering the extension lectures to be offered by the Association. Owing to the co-operation shown by the medical faculties of the Universities of the province and the profession at large, the schedule will be a very complete and comprehensive one. Copies, when ready, will be mailed to the members of the Association.

The Essex County Medical Society has appointed an efficient Committee to conduct the 43rd annual meeting of the Ontario Medical Association, which is to be held in Windsor on May 29th, 30th, 31st, and June 1st, 1923; Chairman, Dr. E. R. Secord, Brantford; Vice-Chairman, Dr. P. A. Dewar, Windsor; Secretary, Dr. T. C. Routley, Toronto; Vice-Secretary, Dr. R. E. Holmes, Windsor. Committee on Arrangements: Chairman, Dr. R. D. Morand, Windsor; Doctors Frank Adams, Brockershire, Lanspeary, Moody and Wiley. Committee on Entertainment: Chairman, Dr. Casgrain, Windsor; Doctors Cruickshank, Fred Adams, Little, Laing, St. Pierre, Bucke and Robson.

District Number Four of the O. M. A. held an interesting session at the Clifton Hotel, Niagara Falls, on August 29th, which included a comprehensive afternoon programme, a dinner, and round table addresses. The programme in the afternoon was as follows: "Common Skin Affections,' by W. R. Jaffrey of Hamilton; "A Study of the Symptoms of Hypo-Tension," by W. K. Colbeck of Welland; "Psycho-Analysis," by G. S. Glassco of Hamilton; "Some Phases of the Goitre Problem," by J. K. McGregor of Hamilton; "Notes on Fractures," by F. W. E. Wilson of Niagara Falls; "Venereal Disease," by R. R. McClenahan of Toronto, illustrated by slides provided by the Government of Ontario. Addresses after dinner were made by Dr. E. R. Secord, the president of the Ontario Medical Association, and by Dr. T. C. Routley, its secretary. Dr. J. W. F. McCullough of the Provincial Board of Health, spoke on "Health Conditions in England;" and Dr. B. F. Schreiner of the New York State Institute for the study of malignant disease, in Buffalo, described the method of treatment of uterine cancer as employed in their institute.

District No. 3 of the Ontario Medical Association, comprising the counties of Bruce, Grey and Dufferin, presided over by Dr. T. H. Middlebro of Owen Sound, held its annual meeting in Owen Sound on Friday, September 15th, when the following programme was presented: "Rheumatic Fever and Endocarditis," Dr. Duncan Graham, Toronto; "Bone Infections," Dr. C. L. Starr, Toronto; "Diagnosis and Treatment of Goitre," Dr. Geo. S. Young, Toronto. After a banquet, served in the hall of the Y.M.C.A., addresses were delivered by Dr. E. R. Secord, President, and Dr. T. C. Routley, Secretary of the O.M.A. An attendance of close upon sixty manifested the keen interest evinced by the practitioners of the District.

The Sault Ste. Marie Medical Society held an afternoon and evening session on Tuesday, September 5th, when addresses were delivered by Doctors Duncan Graham, C. L. Starr, E. A. Morgan, E. R. Secord, and T. C. Routley, who were on their way to attend the District meeting at Port Arthur and Fort William. A keen discussion followed each paper, and it was evident that the programme was much appreciated.

The same lecturers presented papers before District No. 10 of the Ontario Medical Association, comprising Kenora, Patricia, Rainy River and Thunder Bay, at Port Arthur and Fort William on September 7th and 8th. Hospital clinics occupied the morning and papers were read at the afternoon, and evening meetings; ample opportunity was given for thorough discussion of the various topics presented. The attendance was excellent, and the meetings altogether successful.

The Peel County Medical Society held five meetings in August, all in Brampton. The programme presented at the first meeting contained the names of Dr. Fletcher McPhedran, who spoke on the "Diagnosis and Treatment of Pneumonia;" of Dr. J. H. McConnell, who spoke on "Extra Uterine Pregnancy;" and Dr. E. B. Hardy, who spoke on "Cystoscopy." At the second meeting held on August 10th, Dr. D. K. Smith of Toronto, spoke on the "Diagnosis and Treatment of Common Skin Affections;" Dr. Harvey Clare of Toronto, on "Mental Disease;" and Dr. J. E. Mullin of Hamilton, spoke upon the work of the Ontario Medical Association, and upon the question of "Medical Politics." At the third meeting of this Society on August 17th, Dr. F. W. Marlow of Toronto, described the pathology, clinical signs and treatment of Uterine Hemorrhage; Dr. H. M. Tovell of Toronto, spoke upon the "X-Ray Findings in Pulmonary Tuberculosis," and showed slides illustrative of the various conditions. Dr. Stewart Cameron of Peterboro, addressed the meeting on "Uterine Carcinomata. At the fourth meeting Dr. C. H. Gilmour of Toronto, addressed the meeting on "Inflammatory Diseases of the Pelvic organs;" and Dr. R. W. Mann spoke of the "Aid to the Practitioner that a Laboratory Might be Expected to Contribute;" Dr. George W. Ross gave an address on the "Pathological Gall-bladder." At the fifth meeting on August 30th, Dr. A. B. LeMesurier of Toronto, spoke on "Fractures of the Femur;" Dr. George S. Young on "Psycho-Therapy from the Standpoint of the General Practitioner;" Dr. Stewart Wright gave his personal experiences in the "Investigation of Chronic Arthritis;" and Dr. R. I. Harris described "Some of the Abdominal Emergencies of Childhood."

NEWS ITEMS TO APPEAR IN THE FOLLOWING ISSUE, AND TO BE OF VALUE MUST BE RECEIVED BY THE EDITOR BEFORE THE 15TH OF THE MONTH.

BRITISH COLUMBIA

Dr. R. Wightman, of Vancouver, has resigned from his position of School Medical Officer.

The British Columbia Medical Association held its annual meeting at the University of British Columbia, in Vancouver, on August 21st and 24th. There was a large attendance at the two evening sessions, and included many members from the interior and from Vancouver Island. Among the latter was Dr. L. G. Milne, of Victoria, the oldest practising physician in the province. After a relatively quiescent period during the period of the war, the Association was again put on an active basis a year ago with a membership of 295. This year the membership has increased to 375, and comprises the majority of physicians and surgeons practising in the province. To Mr. C. J. Fletcher, of Vancouver, the Executive Secretary, this rapid increase in membership is in a large measure due.

During the year the Educational Committee of the Association carried out a public health campaign in the larger centres and the hearty response with which this effort was received justifies the hope of further activities along similar lines in the future.

Much routine business was transacted during the sessions of the past year including the adoption of a new Constitution and By-Laws.

The following officers were elected for the ensuing year: President, Dr. Eden Walker, New Westminster; Vice-President, Dr. W. O. Rose, Nelson; President-Elect, Dr. Geo. Hall, Victoria; Immediate Past President, Dr. A. S. Munro, Vancouver; Secretary-Treasurer, Dr. W. A. Clarke, Vancouver; Executive, Drs. F. W. Andrews, W. P. Patterson, M. W. Thomas and H. E. Tremayne.

The annual Summer School of the Vancouver Medical Association was held as usual in August. Lectures, clinics, laboratory demonstrations and operative clinics occupied the entire week of August 21st to the 26th. The number registering was 175, almost as many as last year despite the counter attractions across the line. Many excellent clinics, bedside and operative, were provided by members of the Association; Dr. A. T. Bazin, of Montreal, and Dr. W. D. Connell, of Kingston, each gave four lectures. Dr. Bazin chose as his subjects, cholecystitis, empyema, breast tumours and hernia. Dr. Connell spoke on the anæmias, arterio-sclerosis, spastic paraplegia and the arrythmias of the heart. Lantern slides were freely used and the pathological specimens and plates which Dr. Bazin sent from the museum of McGill University were models in preparation and appearance. A dinner was given under the auspices of the British Columbia Medical Association, providing an enjoyable opportunity to relax from the serious strain of the previous days.

Obituary

Dr. Samuel D. Cameron, formerly of Arthur, Ont., died suddenly at Yakima, Washington Territory, on August 18th.

Dr. James Clark Manning, formerly of Ontario died in San Antonio, Texas, on August 23rd, in his eighty-first year.

Dr. J. G. Hanley, a graduate of Queen's, 1902, died in Kingston on August 29th, aged 44 years. Dr. Hanley had practiced in New York, but at the outbreak of the war went for service with the Imperial Army, and did excellent work in Egypt, Mesopotamia, Gallipoli and France.

Dr. Alexander Hamilton, a remarkably fine type of the "doctor of the old school," died in Toronto on July 30th, aged 78 years. A man of many interests, educated in Canada, England, France, Germany and the United States, he was versatile to a degree. A student of the old Toronto School of Medicine; he saw Osler enter as an undergraduate, and leave following some misunderstanding with the authorities, and from him the writer was able at one time to acquire many details of Osler's early life in Toronto. Born in Onondaga, Dr. Hamilton acquired his early education in this village, entering later the faculty of arts of Toronto University. In 1858 he took the silver medal in mathematics. From the University he went into teaching, thence to medicine. After graduating he spent several years in England and Vienna paying particular attention to the then developing work in microscopy; some months were spent in France and a few more in New York, under Austin Flint. For many years he practiced in Port Hope, but in 1884 moved to Toronto where he kept up an active interest in the practice of his profession until a few years ago. In addition to his keen activities in "spelling reform", Dr. Hamilton showed a decided literary bent and for long was a keen student of both the French and German languages.

N. B. G.

Dr. Angus Wylie Kenning, died in Victoria B.C. on August 21st. Born in Elmira, Ontario, in 1868, and educated in the public schools, he started for the West at an early age and joined the Hudson Bay Company in Winnipeg, where many of the old timers will remember "Angus" as one of the lacrosse stars of the old 90th championship teams. In the early nineties he began the study of medicine and graduated from the Detroit School of Medicine in 1895. For a short time he practised in Duluth, Minnesota, but he missed the frontier life of the West, and in 1896 came to British Columbia, and located in Rossland, then the centre of great excitement in gold mining. Here he practised for several years and became Rossland's leading surgeon and one of its most prominent citizens. In 1911 he moved to Victoria where he soon acquired a large practice. Dr. Kenning was an acute diagnostician and careful operator and possessed an unusual degree of sound clinical judgment. He was most active in promoting the interests of the profession. He became surgeon to St. Joseph's Hospital, where he was chairman of the Staff at the time of his death, and surgeon and gynæcologist to the Jubilee Hospital. He was also elected to the presidency of the Victoria Medical Association. He is survived by his wife and two sons, Drs. Gordon C. and Stuart G. Kenning, who were associated with their father in practice.

Dr. Kenning was a man of strong character, broad culture and charming personality, and of the highest integrity of purpose and action, and his memory will long be remembered by his many friends.

NEWS ITEMS TO APPEAR IN THE FOLLOWING ISSUE, AND TO BE OF VALUE MUST BE RECEIVED BY THE EDITOR BEFORE THE 15TH OF THE MONTH.

Dr. Octavius Weld of Vancouver, B.C., passed away after a short illness in the Vancouver General Hospital, on September 11th, at the age of sixty years. His death was due to pneumonia, but his health had been unsatisfactory for some months. He was a graduate in Arts in 1883, and in Medicine in 1886, of Toronto University. In 1889 he received the license of the Royal College of Physicians, and membership in the Royal College of Surgeons. He was a charter member and a trustee of the Vancouver Medical Association and its second president; one of the original founders of the British Columbia Medical Association, a member of the Canadian Medical Association, and consulting surgeon to the Vancouver General Hospital.

To few of us will it be given at the close of our life's work to invoke among the members of the profession, who have lived and worked with us and who know us, so genuine and personal a sense of loss as in the death of this kindly Christian gentleman. Coming to Vancouver twenty-eight years ago, when this city was in its infancy, he has practised here ever since quietly and with simple dignity, upholding at all times the best traditions of a great profession. Associated with the earliest history of the profession in this province he gave himself unsparingly to its service in hospital and in Association work. In the midst of a busy practice no man was more untiring in his attendance; when any important issue was to the fore his voice and influence always could be depended upon on the side that made for righteousness of thought and action. Octavius Weld was interested in everything that stood for what is best in our national life. The outstanding quality of his character was his simple, rugged honesty, which resulted in an "habitual integrity of life". In his passing the profession has suffered a loss which it can ill afford. His wife and children have the deepest sympathy of every member of the profession.

Lumbago and Sciatica.—Aievoli (*Rif. Med.*, May 22nd, 1922), in a review of the above conditions, refers to a series of 1,578 cases recorded by Lindstedt. One group could be correlated into various articular or spinal deformities, inducing a disturbance of the dorso-lumbar muscular mechanics. Some cases seem due to excessive muscular exertion. Others may be due to changes in the nervous supply of the muscles. Sciatica is not a constant clinical entity but rather a symptom complex not precisely delimitable. Many cases of sciatica are associated with definite lesions of the neighbouring organs, and might be looked on as a neuralgia from irradiation, or reflex, comparable to trigeminal neuralgia. —*Brit. Med. Jour.*, Aug. 12th, 1922.

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Book Reviews

Essays and Lectures on Clinical Surgery. By A. MacKenzie Forbes, M.D., C.M., Faculty of Medicine, McGill University, Montreal. Reprinted from a series of articles which have appeared in the "American Physician". Published by The Taylors, Philadelphia, 1922.

This is a very useful book of convenient size for the pocket, beautifully bound in leather with flexible covers, and well printed. Its contents covering 160 pages consist of a series of thirty clinical lectures on subjects of much interest to the practitioner; all of them extremely practical in character. In all diagnosis and treatment occupy the greater part of the lecture, and are treated in great detail. Among the many subjects discussed the more important are the following: Sacro-iliac strain, obstetrical paralysis, pyopericardium, intussusception, spina bifida, scoliosis, club foot, inguinal hernia in infancy and childhood, tuberculous peritonitis and acute osteomyelitis. The majority of the lectures are on orthopædic subjects, but a few deal with affections which fall more into the domain of general surgery. The book is a very readable one. Every page is full of useful information. To the student, and to the general practitioner it can be strongly recommended. A. D. B.

Submucous Resection on the Nasal Septum. By William Neddaugh Dunning, M.D., New York. Surgery Publishing Co., New York.

This is a small book of less than one hundred pages, dealing with the operation for deviated septum. It gives the author's personal experience, and is very freely illustrated. While there is nothing new in this book, it is a very interesting and full description of an operation now very commonly performed. P. G. G.

A Practical Treatise on Diseases of the Skin. For the use of Students and Practitioners. By Oliver S. Ormsby, M.D. Second edition, thoroughly revised; illustrated with 445 engravings and 4 plates in colors and monochrome. Lea & Febiger, Philadelphia and New York, 1921.

This is an excellent work and can be highly recommended to all practitioners. The classification of the diseases is simple yet very complete. The outline of treatment is practical and many most useful suggestions are given. The author must be congratulated on his excellent book. D. K. S

Classics of Scientific Method. The discovery of the circulation of the blood. By Charles Singer. M.D., D.Litt., F.R.C.P., Lecturer in the History of Medicine, London University (University College). Edited by E. R. Thomas, M.A., M.Sc. Price 1s. 6d. net. G. Bell & Sons, Ltd., London, 1922. 75 pp.

A compact treasure of this sort should be in the pocket of every medical man or medical student and it should be among the books prescribed or advised in every curriculum for students of medicine. Dr. Singer whose excellent taste in matters historical has already become known to many Canadians by his contribution to the Osler Memorial volumes, has put before us a wonderful resumé of the most fascinating period in the history of medicine. Not only is it a resumé, but by the skilful arrangement of connecting links the long period between Galen and Harvey is shown as a continuous story. The evolution from Galen through Leonardo da Vinci and Vesalius is concisely and accurately reviewed; the influence of art and anatomy upon physiology is well shown, and surely no one can afford to disregard the information that Leonardo, an artist rather than a physician was one of the first to point out Galen's errors.

The interesting side-chain of Servetus and his conception of the pulmonary circulation is enlightening to a degree. A casual student has long been unable to comprehend how theology's foot was placed on medicine's doorstep and will be ever grateful to the author for the careful explanation. Dr. Singer's sketch of Vesalius, Realdus Columbus, Fallopius, Fabricius of Aquapendente as an apostolic succession of teachers and students in anatomy in Padua producing the final great announcement by Harvey, is a detail deserving of all attention. The influence of the inheritance of a tradition in the work of an institution is nowhere better shown than in Dr. Singer's chapter on Harvey's immediate predecessors in Padua's school.

The history of Harvey's discovery and the epitome and estimate of his work are clearly and attractively given in chapters especially devoted to these questions. Interesting details in the realization of the finer points of the circulation made possible by Galileo and his microscopes are ascribed to Malpighi, Swammerdam, and Leeuwenhoek. There are many reproductions, all of a more excellent type than one expects to see in a small volume of this sort; an excellent index completes the work. It is not too much to say that in this little volume the story of the human circulation may be found well told, and in a manner which should appeal to both the precisian and the artist. N. B. G.

Mouth Hygiene. A Text-book for Dental Hygienists. Compiled and edited by Alfred C. Jones, D.D.S., Bridgeport, Conn.. Second edition, thoroughly revised, with 218 illustrations. Lea & Febiger, Philadelphia and New York, 1921.

This book is written essentially for those interested in the subject of dental hygiene, and will be found very useful not only for those engaged in public health work in relationship to dentistry, but also by the dental student and the general medical practitioner. The book is profusely illustrated and written in simple plain language, which makes it easy and pleasant reading. P. G. G.

A Test for Diphtheria Immunity and Susceptibility. A method of testing the blood for the presence of diphtheria antitoxin has been devised by W. H. Kellogg, Berkerley, Calif., said to be quantitatively accurate, and in this respect superior to the Shick test; also, it has the further advantage that it is applied at a central laboratory on blood which can be sent long distances by mail. In this new test, advantage is taken of the fact that the skin of the guinea-pig is sensitive to the minutest amount of diphtheria toxin.—*Jour. Amer. Med. Assoc.*, June 10th, 1922.

The Canadian
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CHRONIC BRAIN INJURIES WITH REMARKS CONCERNING THE PATHOLOGY AND TREATMENT

William Sharpe, M.D.

New York City.

THE term "chronic brain injury" naturally presupposes a recovery from the acute condition whether the treatment may have been palliative or operative. From the study of a large series of these patients, it has become my opinion that the operative treatment is indicated in only about one-third of the cases; only in those in which the increased intracranial pressure due to hemorrhage or cerebral œdema is of such a height that recovery and future normality is more probable by the operative than by means of the expectant palliative method alone; in the other two-thirds of these patients in whom an increased intracranial pressure is not marked, the assistance of the expectant palliative method of treatment to the natural means of absorption of the intracranial hemorrhage and of the excess cerebrospinal fluid will usually prove sufficient, not only for the preservation of life but also for the recovery of apparent normality. The expectant palliative treatment of these selected patients is frequently aided by profuse bleeding and the discharge of cerebrospinal fluid through a fracture of the vault into the tissues of the scalp and, in selected patients, by repeated lumbar punctures or spinal drainage, so that the intracranial pressure is not permitted to rise to a height necessitating the cranial operation of decompression and drainage. Naturally, all depressed fractures of the vault should be either elevated or removed—whether an increased intracranial pressure is present or not—for fear of future complications of mentality, of emotional reactions and of epilepsy. If, however, in these cases of depressed fractures there is a great increase of the intracranial pressure, as registered by the ophthalmoscope and especially by the spinal mercurial manometer during lumbar puncture, then the operation of removal or elevation of the depressed area of the vault should be preceded by an ipsolateral subtemporal decompression to lower this increased intracranial pressure, so that the local operation of elevating or removing the depressed bone can be safely performed without damage to the adjacent and highly developed cerebral cortex, which otherwise might be extruded and would, as a result, add danger to the decompression. In many of these latter cases, the chances of the patient would be better without any operation than with this method of local operation alone.

Interest in conditions of brain surgery has been greatly stimulated during the past few years; this is due, to a large extent, to the frequency of gun-shot and shrapnel cranial injuries in the recent war. In these direct brain injuries involving a more or less extensive destruction and loss of cerebral tissue, the gross pathology has been rather an obvious one—a penetrating wound of the vault with varying degrees of local bony change and, most important. the opening of the underlying dura with direct cerebral or cerebellar destruction; the associated subdural and intracerebral hemorrhage together with the cerebral edema was the usual cause of the increasing intracranial pressure sufficient to extrude cerebral tissue. The treatment of these acute conditions cannot be described in detail in this paper and I shall limit my observations to those conditions of chronic brain injuries of civil life rather than to those of war; that is, to brain injuries associated and unassociated with fractures of the skull, and especially to the so-called "fracture of the base of the skull;" brain injuries resulting from depressed fractures of the vault will only be mentioned.

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*Read at the Ontario Medical Association meeting, Niagara Falls, June 1921.

Just a word regarding the two stages in these acute conditions of brain injury in which *no* operation should be performed no matter how badly the skull is fractured, how large the intracranial hemorrhage, nor how imminent death may seem: there is first, the stage of severe initial shock, and second, the stage of medullary edema—the terminal period. If a patient is in such a condition of severe shock following the cranial injury that the temperature is subnormal and the pulse-rate is 110 and even higher, and this in addition to the other signs of shock and particularly that of lowered blood pressure, then the treatment should be limited entirely to the treatment of the condition of shock; any operation in this period would merely be an added shock for the patient to overcome; if he should survive, the recovery would not be due to, but would rather be *in spite of*, the operation. If the patient is unable to survive the shock of the injury itself, surely the additional shock of an operation will not aid him. For this same reason, prolonged neurological examinations of the reflexes, fundi, etc. should be postponed and all the efforts directed toward assisting the patient to survive the shock. When this is accomplished, then the most careful examinations are permissible and the appropriate local treatment possible, and the patient's chance of recovery is neither lessened nor even prevented. It is the general condition of the patient in this stage of severe shock that demands immediate treatment rather than the local condition, and an important factor in the high mortality of brain injuries has been the neglect in treating this general condition of severe initial shock. The other important factor in the high mortality of brain injuries has been the frequent delay and postponement of a cranial operation in those patients having an extreme intracranial pressure particularly when due to subtentorial hemorrhage, until the natural resistance of the patient to this high intracranial pressure of hemorrhage or of excess cerebrospinal fluid has been exhausted during a period of hours or of days. Delays of even two or three weeks in those patients having an increased intracranial pressure of less severity and who are yet unable "to take care of it" completely by the natural means of absorption are equally dangerous. If the patient has continued in the stage of medullary compression for a period of hours or even of days, as indicated clinically by the blood pressure being definitely increased and by the rate of the pulse and respiration being irregular and slowed down to even 50 and 10 respectively, and if then the rapidity of the pulse and respiration begins to rise rapidly, while the blood pressure falls and the temperature ascends (the typical picture of medullary edema and the *terminal* stage), it would be reprehensible to advise at this late period any cranial operation "in the hope of giving the patient a chance." These patients all die with or without an operation; in fact, any operation performed in this stage of medullary edema merely hastens the exitus. This period of medullary edema can usually be anticipated and even prevented in the treatment of brain injuries, either by the expectant-palliative method, or by the operative method of cranial decompression and drainage in those cases in which the clinical signs, especially those revealed by the ophthalmoscope and by the spinal mercurial manometer, indicate a marked increase of the intracranial pressure to such a height that it is doubtful if the expectant palliative treatment alone can lower it. To permit a patient to enter and to continue in the stage of medullary compression is running a very great chance either of death or of permanent mental and physical impairment. But on the other hand, if the patient has advanced from the stage of medullary compression into that of medullary œdema with an increasing pulse and respiration rate, no operation is advisable; the patient is not benefitted, to say the least, and cranial surgery is merely discredited.

I realize now that in a recent work upon the diagnosis and treatment of brain injuries,* I did not emphasize sufficiently the relative unimportance (in my opinion) of a definite increase of the blood pressure except as indicating the lateness of the time for operative interference, since this increase of the blood pressure is a sign of medullary compression and the patient should be given an opportunity to recover by an earlier lowering of the increased intracranial pressure, either by the expectant-palliative or by the operative method. If we delay in the treatment until the blood pressure is definitely increased, then we are letting the patient reach a very serious condition of medullary compression and it is frequently too late to aid him even by an operation of decompression and drainage. In my opinion, the ophthalmoscope and spinal mercurial manometric findings are infinitely more valuable than the general blood pressure as a definite and delicate test in ascertaining early the presence of an increase of the intracranial pressure, whether from hemorrhage or from an excess of cerebrospinal fluid. Naturally, the presence of shock is characterized by a lowered blood pressure together with a subnormal temperature and an increased pulse-rate, whereas the stage of medullary œdema presents a rising temperature, pulse and respiration rate and also a falling blood pressure, so that clinically these two periods may at times be confused.

During the eight years, 1913 to 1920, I examined and treated personally over 500 adult patients having acute brain injuries with or without a fracture of the skull. In only 31 per cent. of these patients were there marked signs of an increased intracranial pressure, and therefore, only these patients were operated upon to relieve this increased pressure; the remaining 69 per cent. of the patients did not show definite signs of an increased intracranial pressure and were therefore treated by the expectant-palliative method of absolute quiet, ice helmet and catharsis; if they were in shock, then the routine treatment of shock was employed. It is thus seen that only one-third of the patients having acute brain injuries with or without a fracture of the skull were operated upon, and approximately this same ratio has continued during the past year. It is this careful selection of patients not only in regard to the advisability of an operation and the type of cranial operation to be used, but also, particularly in regard to the ideal time for performing the operation that has made it possible to lower the mortality of the so-called "fractures of the skull" from the average 50 per cent. of most hospitals to 30 per cent. in this series of acute cases, and if we exclude the moribund patients dying within three hours after admission to the hospital from shock and internal injuries, and the many cases in which the fracture of the skull was but an incident in the patient's general condition, then the mortality is brought down as low as 19 per cent. Naturally, the types of alcoholic, arteriosclerotic and nephritic patients so frequently admitted to large municipal hospitals following a cranial injury have a much lessened life expectancy than have the usual types of patient in private practice or in the smaller private hospitals, so that this mortality factor must be remembered whenever statistics of brain injuries are discussed; in the former group of patients, even the most trivial cranial injuries may precipitate an extensive cerebral edema and their reaction and resistance to this condition is greatly impaired.

Within the past few years, the profession has been more and more impressed with the end-results in these patients; to be sure, the preservation of life is essential and yet the idea in treatment of the acute condition should be not only to preserve life, but also to restore to the patient a condition of approximate normality, both mentally and physically. The attitude of the profession toward a patient recovering from a "fracture of the skull," particularly of the base, with his mental, emotional and physical condition not so normal as before the injury is "Well, he had a fracture of the skull, and should consider himself fortunate to be alive." It has been this feeling of comparative helplessness on the part of the profession that has permitted these patients to be much neglected; the mental and physical impairment has been regarded as due to a definite gross primary brain lesion at the time of the injury and therefore, an irreparable condition. Fortunately however, this is a fact in only a small percentage of patients who have had a severe cranial injury with or without a fracture of the skull, and it is these selected patients, having so-called "chronic brain injuries," that I wish to discuss here.

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*The Diagnosis and Treatment of Brain Injuries, with and without a Fracture of the Skull, 1921. J. B. Lippincott Co., Philadelphia.

During the past eight years, I have had the opportunity of examining and treating a large series of patients having acute brain injuries, and at operation and at autopsy I have been impressed with the comparative rarity of extensive cerebral laceration. It is conceded that in large compound, depressed fractures of the vault and in the occasional gun-shot injuries in civil life, extensive cerebral laceration does occur, and that therefore, if the patient should survive, an irreparable brain injury it will present its symptoms and signs. Yet it is indeed most infrequent to have gross tears occur in the cerebral cortex in the ordinary cranial injuries with or without a fracture of the vault or of the base of the skull. At autopsy upon those patients who have died from the extreme initial shock or from an infective meningo-encephalitis or from a terminal medullary edema resulting from high intracranial pressure due to hemorrhage and to an excess of cerebrospinal fluid, the most common of cerebral lesions was a contusion of the superficial layers of the cortex of the anterior and inferior surfaces of either frontal lobe and of the tip of either temporo-sphenoidal lobe; as a rule, there was no extensive laceration but merely a bruising of these areas covered by a thin layer of localized supracortical hemorrhage. Even these findings were not frequent; the most common post-mortem finding was a large amount of free bloody cerebrospinal fluid associated with a layer of supracortical hemorrhagic clot of varying thickness, the brain itself being swollen and edematous, of the so-called "wet" and "water-logged" type. This supracortical hemorrhage and excess of cerebrospinal fluid is also the usual operative finding, and only rarely is a gross cerebral laceration exposed. The relative infrequency of a large cerebral laceration is also suggested by those patients who make such excellent recovery of function, as for instance from a hemiplegia, following most severe cranial traumata with and without an operative decompression, thus confirming the opinion that the immediate paralysis was due rather to local compression of hemorrhage and cerebral edema than to a gross cerebral laceration. It is in those patients having a high intracranial pressure, especially when this is due chiefly to hemorrhage, that the subtemporal decompression and drainage is the treatment of choice, from the standpoint not only of recovery of life but also of the ultimate recovery of function.

In this paper we desire especially to speak of those patients who have recovered from the immediate effects of the acute cranial injury and yet remain with symptoms and signs of definite impairment, such as severe persistent headaches, dizzy spells, early fatigue, inability to work throughout the whole day as formerly, and manifesting a definite change of personality of the depressed or of the excitable and irritable type, in some cases associated with epilepsy in its various manifestations. These are cases that form a most interesting group for study.

It is an opinion rather common among the laity and to a less extent in the medical profession, that once an individual has had a "fracture of the skull," he is never the same again. Definite changes of personality have been observed very frequently with a lessened interest in his surroundings and ambitions, and an unreliability to such a degree that he has been regarded as a "loafer" and a "good-for-nothing." This condition was termed a "post-traumatic neurosis," a functional disturbance resulting from the "shock" of the injury, "concussion" of the brain, et cetera: while the condition of the smaller number of these impaired patients was considered as due to a gross organic injury of the brain at the time of the accident, contusion and laceration associated with hemorrhage of varying degree; in the absence of macroscopic lesions, the pathology was interpreted as probably due to minute, possibly microscopic changes in the cortical nerve cells or in their coordinating and associated nerve tracts; as such, it was regarded as an irreparable condition.

With this post traumatic condition in mind, I attempted in 1912 to ascertain the present status of those patients at three of the large hospitals in New York City who during the preceding decade of 1900-1910 had had a "fracture of the skull." The mortality of the acute condition was 46 to 64 per cent., while the operative mortality itself was 87 per cent; this latter was due chiefly to the type of operation performed, usually an extensive osteoplastic "flap" exposure, and the frequent performance of the operation during the initial stage of extreme shock or in the terminal stage of medullary edema. Under these conditions, Doctor Pearce Bailey was undoubtedly correct in his belief that these patients get along just as well without, as with, operation. Of the patients who were discharged from those three hospitals as "well," "cured" or "improved," I was successful in locating only 54 per cent.; of this number 67 per cent. were still suffering from the effects of the primary injury. The chief complaints were headaches, early fatigue, change of personality and, in a very small number, convulsive seizures. The records of these patients thus impaired were instructive in that their hospital residence was usually longer than that of other cranial injury cases by a number of days and even weeks; while frequent notes were found of cases with prolonged stupor and even of unconsciousness, with severe headache and of retarded pulse rate, symptoms and signs indicative of an increased intracranial pressure, rarely had an ophthalmoscopic examination been made and even more rarely had a lumbar puncture been performed. Upon nine of these selected patients, the operation of subtemporal decompression and drainage was performed even at this late date following the injury, and the operative findings were all similar; no gross cortical lesion was exposed, but a "wet," swollen, œdematous brain under varying degrees of increased pressure; along the supracortical veins in the sulci, however, was a cloudy induration of new tissue formation surrounding the vessel walls, which were also thickened. Microscopical sections have now been made of this condition as it occurred in other patients and in children who had had a supracortical hemorrhage at the time of birth; this tissue formation is now recognized as the organization "residue" of connective tissue of a former layer of supracortical blood which had collected chiefly in the sulci about these veins and had blocked the little stomata of exit of the cerebrospinal fluid through the walls of these vessels—the main channels of excretion of the cerebrospinal fluid into the blood stream. In this manner, a mild condition of external hydrocephalus had been produced.

Microscopic sections of the cortical cells and their normal arrangement have only rarely disclosed a definite change of structure, although this added complication cannot be excluded in any case. It is the pathologic condition, however, about the supracortical veins that has been overlooked in the past; and it has only been since we learned that over 80 per cent. of the excretion of the cerebrospinal fluid occurs through the supracortical veins lying in the sulci, that it has been recognised that this condition of new tissue formation following hemorrhage was the main lesion in causing the edematous brain. Those patients making excellent recoveries with the expectant-palliative treatment alone, and over 50 per cent. of them do, undoubtedly are those in whom the natural means of absorption have been sufficient to "take care of" the free supracortical blood; as a result, no residue or new tissue formation takes place and practically all of the hemorrhage is absorbed.

Those patients who have had an intracranial injury, and most probably a supracortical hemorrhage (with or without a fracture of the skull) who have not recovered their former normality and in whom headache, early fatigue, change of personality or even convulsive seizures persist, should be most carefully examined from the standpoint of the presence or absence of an increased intracranial pressure, as found in the fundi with the ophthalmoscope and more accurately still by the spinal mercurial manometer at lumbar puncture. If no increase of the intracranial pressure is present, then the treatment can be only of the expectant-palliative type, for the intracranial damage has already occurred, whether due to a primary gross or to a minute microscopic lesion of the cortical cells, or to a prolonged high intracranial pressure which has gradually become lower as a result of the atrophy of the cerebral cells, a permanent impairment, to be considered as a compensatory lowering of intracranial pressure at the expense of the brain itself. But if a definite increase of the intracranial pressure persists in spite of the usual expectant-palliative treatment, then the patient can be greatly benefitted and improved by means of an early subtemporal decompression and permanent drainage of the blocked cerebrospinal fluid. The dura should be opened widely and permitted to remain open and not resutured, otherwise the decompression is only of temporary value. Excellent results have been obtained in this class of patients. The earlier the condition of increased intracranial pressure is recognized and lowered to normal, so much more of an improvement can be expected from the operation. In arterio-sclerotic patients who have greatly deteriorated during a period of years, perhaps even to the degree of insanity, little if anything can be expected from an operation at this late date.

In closing, let me merely mention the similar chronic condition occurring in children as a result of an intracranial hemorrhage at the time of birth, usually in cases of difficult labor, with or without instruments. Such cases are usually first children, and unless convulsive twitchings occur within several days after birth or the child is unusually excitable or stuporous, the condition is liable to be overlooked and the baby may be considered a normal child until the seventh or eighth month, and even later. Then it observed that the child is not holding up its head, and later on does not sit up or attempt to stand until months after the normal time; convulsive twitchings may or may not be present; the development of speech is usually retarded; in fact the entire physical and mental activities are delayed in their manifestations. If examinations now show a marked increase of the intracranial pressure, these are the selected patients who can be greatly benefitted by subtemporal decompression and permanent drainage of the blocked cerebrospinal fluid, even so late as several years following the injury. However, the ideal treatment of the conditions of intracranial hemorrhage is at the time of the acute condition—within the first few days following birth in the baby and within a period of hours following the injury in adults. In these new-born babies, if repeated lumbar punctures with removal of large amounts of bloody cerebrospinal fluid do not suffice to lower the increased intracranial pressure, then a modified subtemporal decompression and drainage operation is immediately indicated, just as in an acute brain injury of adults with the symptoms and signs of high intracranial pressure. Infants who survive a birth hemorrhage, whose increased intracranial pressure has not been lowered to normal, cannot develop as they should, either mentally or physically. As a result of this condition, there is produced that large group of spastic and defective children—the bane of the pediatrist, orthopedist and neurologist. After a lapse of years, however, the selected children having an increased intracranial pressure can be only improved by the operative lowering of the pressure. I have now operated upon 489 of these children, out of over 4000 cases examined, of ages varying from five hours to twenty-three years; and I may state that the lesion is practically the same as occurs in adults from cranial injuries with supracortical hemorrhage.

In conclusion, it is only in those patients who have a definite increase of the intracranial pressure that any improvement can be afforded by means of the cranial decompression. If minute sclerotic changes have taken place in the cortical cells themselves, then an irreparable damage has occurred and even if the increased intracranial pressure is lowered to normal by operation, these advanced patients cannot make a complete recovery of function, although the relief of the pressure should improve their condition. In those patients seen early in whom the increased pressure resulting from a partial blockage of the excretion of the cerebrospinal fluid is the main pathological condition and especially in those who have no organic cellular changes the operation of subtemporal decompression and permanent drainage affords the greatest ultimate improvement and, in the more fortunate ones, may even bring about an apparent cure.

SURGICAL THERAPY AND NET RESULTS IN GALL BLADDER DISEASE

From the Surgical Clinic of Dr. F. N. G. Starr

Roscoe R. Graham, M.B., F.A.C.S.

Toronto

In order to arrive at any conclusions regarding the efficacy of surgical therapy in gall bladder lesions, three points must first be very closely considered: First, the indications for surgical therapy; second, the procedures employed, and third, the net results obtained.

The indications for surgical therapy can probably be grouped as follows:

- (A) Life Saving—
  - (*a*) With jaundice
    - Hepatic duct obstruction.
    - Common duct obstruction from stone, with infection.
    - Common duct obstruction from stone with no infection.
    - Acute inflammations.
  - (*b*) No jaundice
    - Acute inflammations in the gall bladder.
    - Rupture of the gall bladder.
- (B) Economic—
  - (*a*) Relief of distressing symptoms
  - (*b*) Increasing of efficiency.
  - (*c*) Prevention of later complications.
    1. All class "a."
    2. Chronic pancreatitis.
    3. Hæmorrhagic pancreatitis.
    4. Carcinoma of the gall bladder
    5. Perforation of gall bladder into gastro intestinal tract, producing obstruction.

I feel that there are few who will doubt the wisdom of at least considering surgery as a possible aid in Class "A." In the hepatic duct obstruction, or in the common duct obstruction with infection, disorder characterized clinically by intense jaundice, and in the case of the common duct by recurring chills and pyrexia, we unfortunately have no choice but to attempt surgical therapy in a patient who presents a desperate surgical risk. In the individual suffering from an acute inflammatory process in the gall bladder in the absence of jaundice, we have a somewhat greater margin of safety than in the individual with a similarly inflamed appendix. However, if a gall bladder remains acutely inflamed and palpable, with no abatement of symptoms after forty-eight hours, we believe that surgical intervention is demanded.

The one clinical fact which appears to be particularly significant in acute inflammatory lesions of the gall bladder, is that the local pathological change is out of all proportion to the constitutional disturbance; as evidenced by pyrexia, tachycardia or leucocytosis; the most outstanding fact being the pain localized over a palpable gall bladder. Even in severe lesions of this type, there may be but very slight rectus rigidity, particularly if the patient is a woman who has borne many children in rapid succession. Thus one should not be be misled by this apparent lack of seriousness of the lesion, but should pay particular attention to the palpable, painful gall bladder which shows no sign of regressing.

A clinical point which has recently been impressed upon us in regard to hepatic duct obstruction is the absence of pain when the stones are situated only in this duct. This is important when we remember that for many years we have all been lead to believe that a painless jaundice was invariably malignant in origin. A recent experience refutes this fact, and emphasizes the necessity of weighing all the evidence, and of not letting a patient with a painless jaundice progress to a fatal issue without an attempted therapy. The obstruction may be found to be of hepatic duct origin and not a malignancy, in which case one may be able to offer a return to health.

No one will question the advisability of surgical intervention in rupture of the gall bladder. However, one must also realize that rupture of the gall bladder occurs much less frequently than one is led to believe from various dissertations in standard text books. In a series of 450 gall bladder cases there have been 3 ruptured gall bladders which were acute, and 4 instances in which an artificial anastomosis had occurred between the gall bladder and the duodenum; in one instance producing an intestinal obstruction. There is, however, one factor of safety in the rupture of a gall bladder which has no analogy in the rupture of an appendix, namely, that, so far as I have been able to observe a general peritonitis never follows; the mentum, with surrounding structures, forms a barrier preventing the extension of this infection into the general peritoneal cavity.

In the case of a common duct obstruction from stone, in which there is no clinical evidence of infection, such as fever, tachycardia, dry tongue and leucocytosis, the time at which surgical therapy should be instituted is open to debate. My own belief is that the obstruction of the common duct, where stones are subsequently found, is the result of an inflammatory reaction around the stone, rather than that the stone, by its size, occludes the whole duct. For this reason I feel that one should delay operative interference until such inflammatory reaction has been given an opportunity to subside, by which time the jaundice will have disappeared in a very large percentage of cases. In our own experience, and in discussing this subject with many other observers, I have been unable to find a single concrete instance of common duct obstruction producing jaundice, which disappeared, followed by the history that a stone was subsequently found in the faeces. It is commonly contended that this occurs with great regularity. My own belief is that if it ever occurs, it must be very unusual and that the remission of the inflammatory reaction is the factor which allows the obstruction to disappear and the jaundice to clear.

In Group "B" which we have termed the economic group, in which the object of our therapy is the relieving of distressing symptoms, the increasing of efficiency, and the preventing of complications, our opinion must be based upon a consideration of the economic factors. It is sad how often, even at the present day, people with gall stones are given calomel and large doses of oil, in the hope that the calculi will be more readily passed. Such treatment is on the level with the therapy of the 18th century, that period of medicine when the British parliament, paid Joanna Stephens 5,000f. for her stone solvent, which proved to be burnt egg shells and snails with Alicant soap.

Surgical therapy in gall bladder diseases which are producing only partial disability, must have for its justification relief from distressing symptoms, an increase in efficiency, and the prevention of later complications. Opinion is now swinging very strongly in favour of surgical treatment for biliary infections. One naturally expects a failure in the medicinal treatment of gall bladder disease; unfortunately the public and a large percentage of the profession expect miracles from surgical therapy. Too often the brilliant surgical results are forgotten in the great outcry which is raised against the failures, either complete or partial, which are inevitable with any form of therapy. The danger in the present popularity of surgical therapy in gall bladder disease is that, as the operation becomes more safe and is done more often in the early stages of the disease with a negligible mortality, the gall bladder will be removed for every pain above the umbilicus, much in the same manner as, in the past, the appendix has been removed for every pain below the umbilicus, with of course no relief from disturbing symptoms in the instances, in which the lesion is situated elsewhere.

TABLE 1

GALL BLADDERS

From January 1st, 1921, to January 1st, 1922

	Recovered	*Died*	*Total*
Acute with stones.................	9	2	11
Acute without stones..............	0	1	1
Chronic with stones...............	23	3	26
Chronic without stones............	52	1	53
With associated chronic pancreatitis	8	0	
Total cases........... 91			
Total deaths.......... 7			

DEATHS CLASSIFIED

Chronic with stones—	1. Gall bladder perforated into the duodenum, making a fistula which had to be undone. Died from shock.
	2. Died one year afterwards from recurrence of duodenal ulcer.
	3. Had an associated large degenerating fibroid. Died from toxemia.
Chronic without stones—	1. Died a year afterwards from duodenal ulcer.
Acute without stones—	1. Had an associated intestinal obstruction and also a 5 months' fœtus. Miscarried 72 hours after operation. Died from shock.
Acute with stones—	1. Died a week later from a broncho pneumonia. Aged 85 years.
	2. Had an associated glycosuria and hæmangioendothelioma of the liver, associated with solitary tubercle of the liver. Died 5 days after operation; cause not definitely determined.

The factors which deter one in advising surgical interference in gall bladder disease producing partial disability are, first of all the possibility of a fatality, and secondly, fear that symptoms will not be relieved. Against that, one must weigh the possible disastrous complication which may follow long-standing unoperated lesions; the most important being the various severe obstructions, the acute inflammations, and the pancreatic lesions, to say nothing of carcinoma. The main factor which determines the primary mortality or the failure to relieve symptoms, is the stage in the disease at which the operative interference is undertaken.

In our series of 91 cases for 1921, there were 7 deaths (Table I). In the chronic cholecystitis without stone formation, there were 52 cases and one death; that one death occurring a year later as the result of a recurrence of a duodenal ulceration, for which a gastro-enterostomy had to be performed. While it is included in our table as a death against a gall bladder lesion, it is to be remembered that this individual suffered the dual disability. The other six deaths occurred, with one exception, when the disease had progressed to the formation of stone, and in that instance there was an associated intestinal obstruction in a patient five months' pregnant, who miscarried 72 hours after operation. This to my mind is very striking evidence in favour of early surgical intervention in gall bladder disease.

It is interesting to note the ages at which this group of patients was submitted to surgical therapy: 10 were under 30 years of age; 23 were between 30 and 40, and 25 were over 40. In the other cases, the age was not stated. This shows a marked improvement in the age of operative interference as compared with some years ago, but we still have practically 45 per cent. who come to operation after 40 years of age; of these 60 per cent. have stones, with all the potential disasters associated with these foreign bodies in the biliary tract. The death rate from operation performed on patients suffering from stones in the gall bladder is in direct ratio to the amount of involvement of the surrounding structures. The failure to clear up all outstanding symptoms in individuals suffering from stones, depends first of all on the amount of trauma necessary to remove the stone, and secondly on the diseased process which has taken place in the liver and pancreas. Therefore one feels justified, from the standpoint of mortality, in advising surgical therapy in gall bladder disease in its early stage.

The following gratifying results regarding amount of relief from distressing symptoms are shown by the 23 replies to questionnaires, received from patients operated upon in 1921:

TABLE II

	Answered this question	*Were relieved*
Gas	20	17
Nausea	17	17
Vomiting	11	11
Constipation	18	16
Mucus in stools	10	10
Blood in stools	2	2
Headache	9	7

Such results, one can feel sure, must increase the efficiency and comfort of the individual suffering from this disease.

In the case of the patients operated upon since January 1st, 1920, we have the following information regarding relief of symptoms:

TABLE III

	Answered this question	*Were relieved*
Gas	45	33
Nausea	35	26
Vomiting	29	23
Constipation	42	33
Mucus in stools	25	23
Blood in stools	2	2
Headache	21	14

It will be noticed that the results in Table II are better than in Table III. This we feel is explained by the increased post-operative care, together with the fact that these patients are kept under observation for longer periods and are being constantly counselled in regard to diet, habits, etc.

In considering the special procedure to be undertaken in any individual case, one must realize that he is dealing with a human being, who possesses various systems, each with a definite metabolic function, and that, as a result of the disease in the biliary tract, other portions of his organism may be upset. The vast majority of the symptoms from which these individuals are suffering are reflex in origin; the most outstanding are the gastric disturbances associated with biliary disease, such as epigastric distress, feeling of fulness, and gas. This emphasizes the fact that, no matter what the operative procedure is, nor how brilliantly it may be executed, it is simply one phase of the treatment of such individuals.

In the treatment of these cases, pre-operative therapy is of extreme importance. This does not consist in the old regime of dehydration by means of catharsis, loss of sleep from enemas, diminished alkaline reserve in the blood from starvation, and terrible thirst from withholding fluids prior to and following operation. Rather do we attempt to place the patient first of all in such a mental state that worry is abolished to the greatest possible extent. Cathartics are given some time before the operation, preferably in the morning, In order that sleep may not be interfered with. if the nourishment is below par, they are given glucose either intravenously or by means of the Murphy drip per rectum, in an effort to raise their alkaline reserve, and prevent the subsequent onset of an acidosis, making sure, of course, as in all surgical cases, that no lesion in any other system has been overlooked. This may sound superfluous, but when one becomes particularly interested in a definite lesion, it is only by continuous watchfulness that lesions in other systems are not overlooked, which might prove disastrous.

It becomes imperative at times to advise and undertake surgical therapy in the presence of a very severe jaundice. In such cases it was our practice in the past to give 100 grain of calcium daily for two or three days prior to operation, coupled with blood transfusion immediately before the operation. Following the transfusion of 600 cc.'s of blood prior to operation in a recent case of absolute biliary obstruction of ten weeks' standing, there was no undue worry from hæmorrhage or oozing during the operation. Recently Walters' work in the Mayo Clinic has demonstrated the efficacy of 5 cc.'s of a 10 per cent. solution of calcium chloride given intravenously daily for three days prior to operation. By this means he found he could control absolutely the clotting time within normal limits, despite a most intense jaundice. We can confirm the efficacy of this treatment and we have since, used it on all our jaundiced cases.

In the selection of an anæsthetic, the essential requirement is that it should produce complete muscular relaxation. For that reason we prefer open ether anæsthesia, rather than gas and oxygen with or without the addition of a local anæsthetic.

Regarding the actual operative technique itself, there are certain fundamental principles which apply here as in all abdominal surgery. First of all, it is essential that the approach give free access to gall bladder and ducts and it must leave an abdominal wall firm and unlikely to give way, thus precluding the possibility of hernia. Secondly, all manipulation should be as gentle as possible, in order to avoid shock and post-operative adhesions. Thirdly, the operation should be a procedure which, in view of the patient's condition, is one unlikely to produce a fatality. We all recognize that it is useless to do a brilliant operation and have the patient die, and we also know that it is much harder to do a less severe operation when we feel the more radical one is called for by the lesion, but here the surgical judgment of the individual operator must decide. However, before a direct attack on the gall bladder and ducts is ever carried out, we feel that it is absolutely essential to explore the stomach, duodenum, pancreas and ileo-cæcal region. In this way, and in this way only, can one gain a comprehensive co-relation of the whole pathological condition causing the individual's disability. We would here emphasize as well, the importance of not carrying out operative procedures on the pelvic viscera, or the repair of herniae simultaneously with a gall bladder operation. This subjects the individual to a risk which is wholly unjustifiable. One must remember, however, that lesions in the gastro-intestinal tract must be dealt with, in addition to the biliary lesion, in order to relieve the patient of a gastro-intestinal disability. Whether such therapy in other portions of the gastro-intestinal tract is to be undertaken simultaneously with the gall bladder operation is a question of individual surgical judgment. All things being equal, there appears now to be no argument regarding the efficacy of removal of a diseased gall bladder, as opposed to drainage. Drainage rather than excision may be indicated, first in the presence of extremely severe lesions, which demand a minimum of operative interference, and secondly in the more chronic types of lesion which present too great technical difficulties.

In our series of 91 cases (Table I) there were 7 drainages; 12 of these 91 cases were acute. Of these 12 acute cases, 7 were removed and 5 drained. Of the 7 which were removed, 1 died one month after, but in addition to an acute lesion in his gall bladder, he had pancreatitis, with obstruction in his common duct, necessitating a secondary operation, which was followed by pneumonia and death. There were only 3 deaths in the series of acute cases.

It is inevitable that a certain number of post-operative adhesions will follow these procedures, but one can obviate serious adhesions to a very large extent by closing the raw surface of the liver from which the gall bladder is dissected. In a certain number of cases this is not possible, due to the extent of the raw surface, or to friable liver tissue being impossible of approximation. In such an event, a free omental graft fastened in this area will prevent disabling adhesions of the duodenum to the denuded surface. This adhesion of the duodenum to the raw area from which the gall bladder is removed, appears to be a most serious post-operative complication, and by these procedures should be obviated.

An associated chronic pancreatitis is, we feel, amenable to surgical therapy. It has been stated that a chronic interstitial pancreatitis is no more amenable to surgical interference than is cirrhosis of the liver. However, in view of Archibald's work proving that spasm at the sphincter of Oddi plays a large rôle in the production of both acute and chronic pancreatitis, we feel that, while one may be unable to altogether undo the damage which has taken place, further destruction can at least be prevented. This is accomplished by means of an opening in the common duct, through which is passed into the duodenum a No. 6 English gum elastic catheter. This catheter, by its continued presence, causes the relaxation of the sphincter of Oddi, with the free flow of bile around it into the duodenun, and has the additional advantage that nourishment (in the form of glucose) and medication, may be introduced directly into the duodenum through this tube. Pancreatitis was present in ten per cent. of the cases operated upon last year.

Formerly it was considered that an operation should practically accomplish a miracle, and the patient who did not immediately feel well following a surgical procedure, was given very little sympathy. In our follow-up system, we have found very few people recover wholly from such an operation within three months. Further, one must remember that their sympathetic nervous system has been rendered hyper-irritable, as is evidenced by the gastric disturbance from which all these people suffer, and that in our operative procedure we can only remove the cause. It must, therefore, be left for nature to finally consummate that return to the normal conductivity of this nervous system, which will be followed by a remission of the symptoms; hence let us still carry our patients for some months after the operative procedure, and not discourage them by painting before operation, a picture of glowing health immediately on discharge from the hospital. Save in a very few instances it is my belief that individuals who have been subjected to surgical therapy for gall bladder disease do not receive the maximum benefit until eighteen months after their operation.

In the past, it has been the custom to neglect what were apparently unimportant details in the post-operative care, with the result that radical therapy was not instituted until some alarming complication ensued. We have tried to prevent this by instituting preventive measures immediately the patient returns to bed; here may be noted the crowding of fluids by means of a Murphy drip containing glucose, which also aids in preventing the production of an acidosis. We aim to ensure relief from pain by the generous use of morphia, the abstinence from severe cathartics, and the cautious use of enemas; distention is dealt with as soon as there is any evidence thereof, by means of a hot linseed poultice applied over the whole abdomen, occasionally accompanied by pituitrin given sub-cutaneously. In the past, one alarming post-operative complication was tachycardia. This we feel has been almost completely eliminated by digitalizing patients by giving from one to two drachms of concentrated digitalis (B. & W.) in the first siz ounces of the Murphy drip solution, immediately on their return to bed. This has been proven to be of inestimable value.

Should pneumonia, or more accurately, chest complications, occur following this type of operation, daily examination of the chest should be made, and at the first evidence of moisture, counter irritation in the form of generous hot linseed poultices should be immediately applied. This condition, if dealt with in its early stages, may largely be controlled.

Occasionally stones are found in a gall bladder that had previously been drained. While it is possible that they may be of recent formation, their presence is more often the result of failure to detect them at the original operation. This may be condoned if the primary operation was for the drainage of an acutely inflamed organ, and may be excused in certain chronic cases in which the gall bladder contained enormously dilated crypts of Lusheka, in which a stone had formed, and which could easily be missed, owing to the thickness of the walls.

To summarize: We feel that in view of the inefficiency of other forms of therapy in controlling sequelae and relieving symptoms of gall bladder disease, surgical therapy should be instituted, preferably in the early stage of the disease prior to the onset of complications, at which time the mortality is practically negligible; and further that such surgical therapy, judiciously applied, will cure 66 per cent. and improve 34 per cent. of cases which survive the procedure.

A CLINICAL STUDY OF CANCER OF THE UTERINE CERVIX: SUMMARY OF THE RESULTS OBTAINED BY VARIOUS METHODS OF TREATMENT*

James W. Ross, M.B.

Fellow in Surgery, The Mayo Foundation, Rochester, Minnesota

FOR the purpose of estimating the relative values of various forms of treatment in cancer of the cervix, a study was made of 475 cases seen in the Mayo Clinic between January 1, 1913, and January 1, 1919. The latter date was chosen so that at least three years should have passed since the patients were first seen at the clinic.

Cancer of the cervix is essentially a local disease. Leitch, in a review of 915 necropsies on patients dying from the disease, found hydronephrosis in 75 per cent. He estimated the duration from onset of symptoms to death, at twenty-one months. Regional lymph nodes were involved in only 38.36 per cent., although this percentage is probably too low if judged by the collected statistics of Döderlein. These patients die of cachexia and uremia rather than extensive metastatic cancer.

The radical abdominal operation, Wertheim hysterectomy, undoubtedly carries a prohibitive mortality in the hands of most operators. We must, therefore, seek an index of the rate of extension of the disease and subject only those patients to extended hysterectomy who have highly malignant tumours, and for whom prognosis for ultimate cure is poor. In the past, the cautery and the knife have been recognized agents in treatment, although a multitude of "cures" have been suggested. More recently, radium, and high voltage roentgen-ray therapy have been introduced. Reports of results obtained by many observers using various methods are confusing, owing chiefly to the fact that the estimated stage of the disease is subject to the personal equation of the observer. The effect of radium may be subject also to variation with the dosage, and the method of application.

In 1912, Percy introduced a method of prolonged cauterization by slow heat, and cited cases of patients who had remained free from recurrence for periods varying from three years to eight months. In 1918, he reported cases of sixty-five patients treated by this method, ten of whom (15 per cent.) were living from two to nine years after operation. A series of forty-three inoperable cases is reported by Cole. He estimates the average prolongation of life at ten months. In seven instances the patients had lived for periods of three years, and in all amelioration was obtained. Balfour, in 1916, reported favourably regarding this method employed in inoperable cases. Later observations on the same patients showed that cure was effected in only two cases as far as is known.

In 1915, Kelly and Burnham reviewed 213 cases of cancer of the uterine cervix and vagina, fourteen of which were operable and 199 inoperable, and reported cures in fifty-three of the inoperable. Kelly believes that three of every four cases of apparently hopeless cancer can be cured by radium and surgery. On the other hand, Graves, in 1921, said very definitely that radium does not permanently cure. He believes that a few inoperable cases may be rendered operable and the patients may live many months and die of recurrence. But in the treatment of recurrences he believes that radium offers more than any other method. One of his patients treated with radium lived three years, and one is now living six years after recurrence. In cases favourable for surgery he does not feel justified in substituting radium. Bailey also obtained good results, but the time was too short accurately to judge the outcome.

In a recent paper Clark was extremely enthusiastic with regard to the effect of radium. In 214 cases of inoperable carcinoma of the cervix, twenty-five patients (11.6 per cent.) had lived more than three years, and forty-one others were living more than a year after treatment. Only nine, however, had lived five years. Duncan and

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Schmitz have reported encouraging results. These operators used larger doses than was the custom at the Mayo Clinic during the period covered by the present review. Clark inserted radium needles into the base of the broad and ureterosacral ligaments, a procedure which has not been carried out in the Clinic. Our immediate results have been encouraging but not sustained in the curative sense. However, it is to be hoped that, when sufficient time has elapsed in which to judge the results of treatment during the past three years, there will be a definite increase in the number of patients cured.

In the present series radium was used in inoperable cases in most instances. These patients received vaginal and intracervical applications of about 700 mg. hours (50 mg. for fourteen hours) three or four times in ten days, with usually one or two rectal applications of 100 mg. hours. They returned at intervals of from two to three months for similar treatment. Now, however, bare radium tubes (wall 0.5 mm. silver) are inserted into the cervix and uterine canal after the redundant growth has been reduced by radiation if necessary. The dose, 700 to 3,000 mg. hours, in favourable cases is given at a single sitting and a total of 9,000 to 12,000 mg. hours is given within a period of three weeks. Roentgen ray is also used, but the high voltage radiation has not been tried. The results here recorded must not then be considered as the final conclusions of the staff of the Mayo Clinic relative to radium and nonoperative treatment.

From reports of various authors it would seem that the Wertheim hysterectomy in operable cases offers the best prospect of permanent cure. Graves, in 101 cases, had six operative deaths, 27.6 per cent. five-year cures, and 16.8 per cent. ultimate cures. Still more recently Bonney in 100 cases reports five-year cures of 50 per cent. of the eighty patients who recovered from operation. Including inoperable cases he has 26.1 per cent. five-year cures. His percentage of operability is 63.5, which agrees with that of Graves (64 per cent.), while his immediate mortality has been reduced to 6 per cent. in the last fifty cases. Shaw reports similar results, but it is yet too soon to judge his results. He advocates the use of radium to render the lesion operable, which otherwise would be left to palliative measures.

The operation employed in the series of 475 cases was in some instances a modified Wertheim, less drastic in the extent of dissection than the operation originally advocated. In other instances a much more conservative procedure was carried out, in which a cuff of vagina well beyond the growth was removed with as much of the parametrial tissue as was deemed advisable. The ureters were freed.

The interval between cautery and hysterectomy which gave the most favourable results was one month; most patients operated on after a greater lapse of time did not obtain permanent relief. It is generally conceded that hysterectomy following radium treatment, should be performed after from two to four weeks. This interval allows cellular destruction to take place and antedates fibrosis. Only one patient was radiated one month prior to operation; she lived eight months. However, this procedure is now being carried out in practically all operable cases. Vaginal hysterectomy was performed by the clamp and cautery method.

Besides 475 cases in the series there were eight cases of cancer in the stump of the cervix following hysterectomy, and seven cases in which no treatment was given other than explorations, excisions of specimens, and simple currettage which are not considered. None of these fifteen patients are living.

Sixty (12.6 per cent.) of the 475 patients are living. All have, therefore, lived more than three years. Three hundred and twenty-two are dead. There were four operative deaths, one after simple cautery, two after Percy cautery and one after Percy cautery and hysterectomy. In three hundred and forty-seven cases (January 1, 1922, Table I) the length of life is known. Certain of the patients are living and certain are dead.

The cases were divided into five groups. This admits of error as the grouping is based on the operative findings only when they were available and at other times, on the history of the clinical findings. Group 1 contains the early cases in most of which microscopic examination was necessary to establish a diagnosis. In Group 2 are cases which may be considered operable; there is no extension to the vaginal wall, the uterus is movable and the broad ligaments thickened very little if at all. Group 3 is comprised of cases which might be considered operable were it not for extension to the walls of the vagina. Group 4 contains inoperable cases as determined by fixation and infiltration of the broad ligaments. Group 5 is made up of advanced cases, with involvement of bladder or rectum (Table I).

Thirty-three modes of treatment were used, depending on variations in technique, as for example, in the use of the Percy cautery, whether or not the abdomen was opened and in hysterectomy whether performed immediately, or later. The methods are grouped under four main headings, surgery, radium, Percy cautery, and simple cautery; sub-headings indicate combinations of two or more (Table II to Table VI).

Several factors were common in the series. The average age was practically the same in all groups, forty-eight years; in Group 2, forty-nine years, and in Group 4 forty-seven. The youngest patient was twenty-three and the oldest was seventy-two. All except eleven were married and had borne, on an average, four children. The ages of the youngest children averaged sixteen years. Two of the unmarried women are living. In twelve instances the onset of symptoms occurred during pregnancy, and two of these patients are living. Reports from microscopic examination were available in 277 cases. Squamous-cell carcinoma was found in 249, and adenocarcinoma in twenty-eight. The preponderance of the former, 89.9 per cent., is slightly higher than that given by Ogata (87.7 per cent.).

If the cases in Groups 1 and 2 are considered, the percentage of operability is 44, which is somewhat lower than that of Bonny, Graves, Cullen and others. If cases in Group 3 are included the percentage is raised to 62. Some of the cases in this group proved operable (Table 4).

The average duration of symptoms in each group before the patient sought advice shows a gradual increase in the successive groups. In Group 1 it was 4.6 months; in Group 2, 6.7 months; in Group 3, 6.8 months; in Group 4, 7.6 months; and in Group 5, 11.2 months. This illustrates how a short delay may carry a patient beyond the possibility of operative aid. In fifty-two cases there was delay owing to the physician's failure to recognize the condition. This demonstrates two points: (1) the disease was sufficiently advanced in most cases to be recognized, and (2) a diagnosis was not made and should have been made in certain cases. The patients might have been saved an average of six months of valuable time had a biopsy been made.

In reviewing the results, the normal death rate for women of this age must be borne in mind. It is estimated that forty-three of the 475 would have died during the nine year period. Tables I to VI will show the results obtained. The number of patients treated whose span of life is known, the number surviving four and five years, and the number who died early (within the first year) serves to show the efficacy of the various treatments. If, therefore, under any given treatment we can show a large number of patients who lived four and five years and a small number of early deaths, I think it will be conceded that this treatment is of distinct value as compared with one showing the reverse.

In a few instances the diagnosis of cancer was not confirmed microscopically but in all the tumors were clinically malignant. This applies more particularly to the cases in which radium was used in the earlier years. Since in some of the patients who died the nature of the growth was not known, and it was impossible from the replies received to establish whether death was due to cancer or to other causes, it is reasonable to assume that some of the patients living, who had no microscopic findings, had cancer. In the cases in which the patients are living, diagnoses were positive in all except seven. I have examined specimens of tissue removed in forty of these and I am indebted to Dr. Broders for confirmation of my findings. These specimens were studied from the histologic standpoint to determine if their structure contributed in any way to the survival of the patients concerned. The epitheliomas were graded according to Broders' classification on a scale of 1 to 4. Six (16.6 per cent.) were in Grade 2; twenty (55.5 per cent.) in Grade 3, and ten (27.7 per cent.) in Grade 4. Of the four adenocarcinomas studied one was of particular interest in that it showed marked metaplasia (Figs. I to IV). From these findings it is apparent that even in the case of patients who survive, the tumour is usually of a very malignant type and complete destruction of the growth must be accomplished early if good results are to be obtained.

The length of life under various treatments brings out several interesting facts, although the percentages are based on numbers much too small to render them of value other than comparative (Table VII). It will be seen that the efficacy of vaginal hysterectomy in certain cases is indisputable. Of the nine living patients treated by this method, the greater number had early lesions although one had extension to the vaginal wall (Group 3). Another point well illustrated, if we accept the supposition that similar numbers of tumours of like potentialities are present in the various minor groups, is the fact that delayed

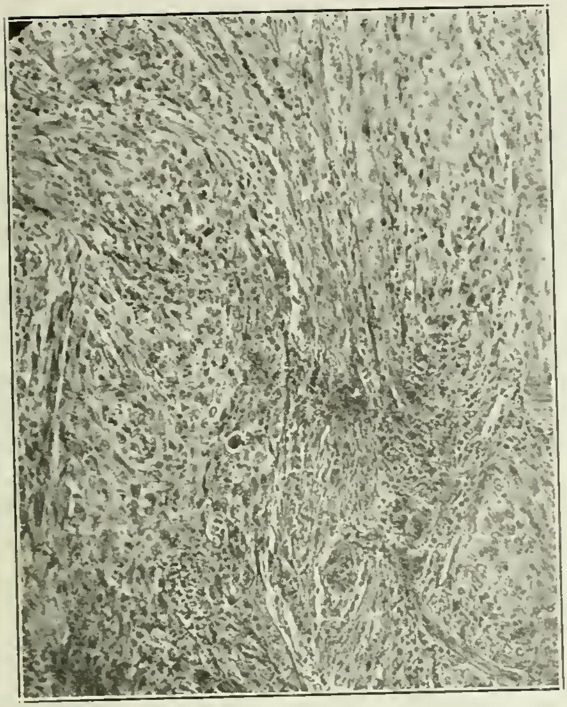

FIG. I (Case A129862).—Squamous-cell carcinoma of the cervix, Grade 4. Active cells with no tendency to differentiation. Patient living and well five years and ten months after total abdominal hysterectomy. (X100).

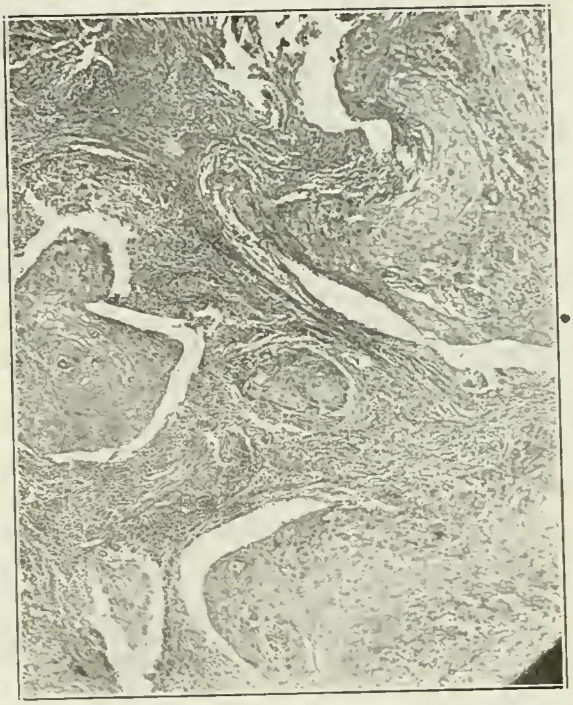

FIG. III (Case A147230).—Squamous-cell carcinoma of the cervix, Grade 2. Differentiated and undifferentiated cells in about equal proportions. Patient living and well five years and ten months after total abdominal hysterectomy. (X50).

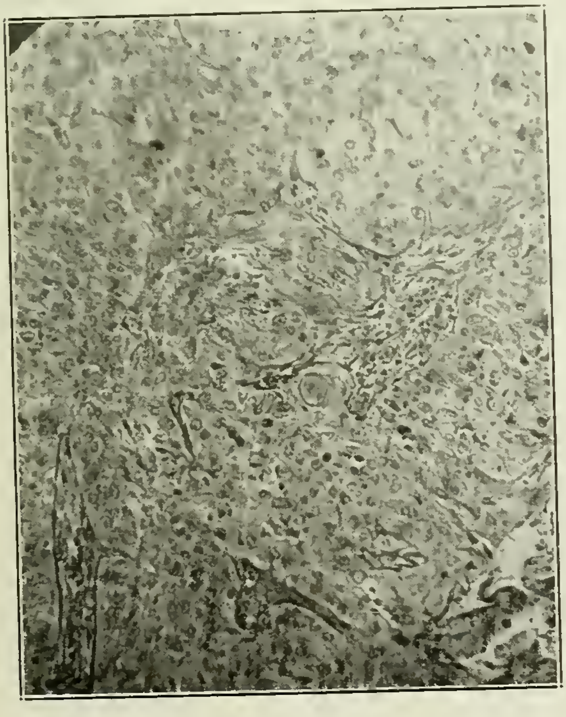

FIG. II (Case A166324). Squamous-cell carcinoma of the cervix, Grade 3. Active cells with small area of keratinization. Patient living and well five years and four months after Percy cautery and immediate abdominal hysterectomy. (X100).

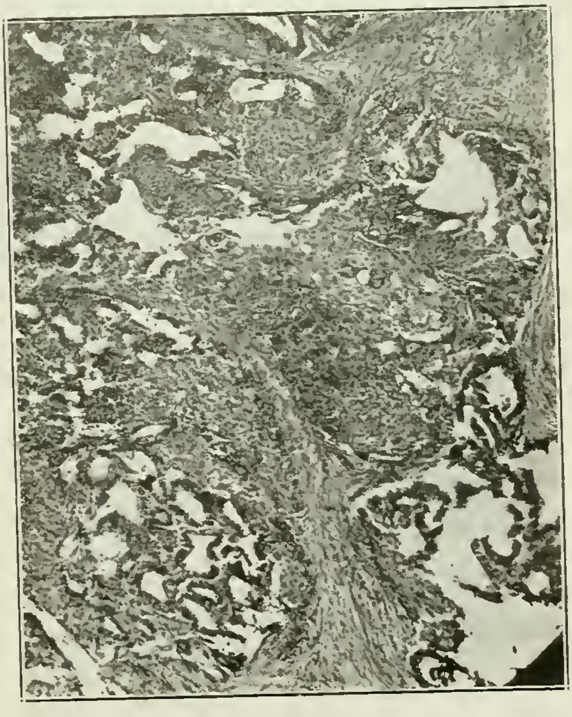

FIG. IV (Case A245369).—Adenocarcinoma of the cervix showing metaplasia. Patient living three years and one month after vaginal hysterectomy with recurrence. (X50).

hysterectomy gave better results than immediate hysterectomy in conjunction with simple cautery and Percy cautery. Furthermore, total abdominal hysteresctomy and vaginal hysterectomy, when supported by radium, gave almost identical results, which were apparently slightly better than from either agent alone.

The results of treatment by radium were disappointing. Of 133 patients so treated only six are known to be living; on the other hand, three living patients were treated by cautery and radium. These results must not be given too much weight or used to condemn the method, for the majority of patients obtained inestimable relief, which could not have been given by any other means. The dose used at that time was later found to be too small.

The Percy cautery proved curative in only two early cases, although palliation was effected in the remainder, as cited by Balfour in an earlier review of some of these cases.

Twenty patients of Group 1 (Table II) were treated by surgery alone. Information relative to length of life, is lacking in four instances. Nine are known to be dead and seven living; no patient died within the first year. Nine were living four years after treatment and six were living five years. If these results are compared with those of other methods and the degree of involvement indicated by the group is con-

TABLE I.
GROUPING OF CASES.

GROUP	Patients	Dead	Length of life known in	Living	Lived more than five years	Lived more than four years	Died in less than one year	Average length of life, years
1. Early	65	26	51	27	11	25	3	3.58
2. Operable	142	91	104	24	17	25	26	2.66
3. Inoperable only on account of extension to vagina	87	64	62	5	5	5	28	1.66
4. Inoperable	145	112	105	4	1	3	59	1.08
5. Advanced	36	29	25	—	—	—	21	0.58
Total of all groups	475	322	347	60	34	58	137	——

TABLE II.
RESULTS OF VARIOUS FORMS OF TREATMENT IN EARLY CASES.
GROUP 1

TREATMENT	Patients	Dead	Length of life known in	Living	Lived more than five years	Lived more than four years	Died in less than one year	Average length of life, years
Surgery	20	9	16	7	6	9	—	4.08
With simple cautery	5	1	5 }28	4 }15	2	3	1	4.0
With radium	11	5	10	6	—	5	—	4.0
With simple cautery and radium	4	2	4	2	—	2	—	3.75
With Percy cautery	10	4	6	2	1	2	2	2.25
With Percy cautery and radium	3	2	3	1	1	2	—	3.41
Radium only	5	1	3	2	—	—	—	2.58
Percy cautery and radium	3	2	2	1	1	1	—	4.0
Simple cautery	1	—	—	—	—	—	—	——
With radium	3	—	2	2	—	1	—	3.91
Total	65	26	51	27	11	25	3	3.58

sidered, a fairly accurate estimate may be made of the relative values of the methods in different stages of the disease (Tables III, IV, V, and VI).

The point may be raised that these cases are not accurately grouped, else why do we find any cases in Groups 1 and 2 treated by other means than surgery. On account of factors such as obesity, cardiac decompensation, and the personal considerations of the patient, some early cases were treated by radium. On the other hand, the probable accuracy is borne out by the gradually

TABLE III.
Results of Various Forms of Treatment in Operable Cases.
Group 2

Treatment	Patients	Dead	Length of life known in	Living	Lived more than five years	Lived more than four years	Died in less than one year	Average length of life, years
Surgery	26	15	24	9	11	12	2	4.33
With simple cautery	9	7	9	2	1	1	1	2.50
With radium	6	4	6	2	—	1	—	2.29
With simple cautery and radium	8	1	4 }42	3 }12	—	1	1	2.66
With Percy cautery	27	21	20	4	4	7	3	3.08
With Percy cautery and radium	8	3	3	1	—	1	1	2.33
Radium only	21	16	17	2	—	1	8	1.50
Percy cautery	23	15	14	1	1	1	6	1.66
With radium	2	2	1	—	—	—	—	2.58
Simple cautery	3	2	2	—	—	—	1	0.66
With radium	9	5	4	—	—	—	3	0.75
Total	142	91	104	24	17	25	26	2.66

TABLE IV.
Results of Various Forms of Treatment in Group 3

Treatment	Patients	Dead	Length of life known in	Living	Lived more than five years	Lived more than four years	Died in less than one year	Average length of life, years
Surgery	6	2	4	2	3	3	—	4.33
With simple cautery	4	4	3	—	1	1	—	2.91
With radium	1	—	1	1	—	—	—	3.91
With simple cautery and radium	1	—	1 }10	1 }3	—	—	—	3.00
With Percy cautery	5	1	2	1	1	1	—	3.75
With Percy cautery and radium	4	3	3	—	—	—	1	2.20
Radium only	39	30	26	—	—	—	15	1.0
Percy cautery	12	11	10	—	—	—	4	1.66
With radium	2	1	1	—	—	—	—	3.50
Simple cautery	6	5	5	—	—	—	3	1.16
With radium	7	7	6	—	—	—	5	0.83
Total	87	64	62	5	5	5	28	1.66

increased mortality, the shorter period of life, and the longer duration of symptoms in the higher groups.

Of the eleven patients of Group 1 who lived more than five years, ten were treated surgically. Two of the three treated by radium who have been traced were living three years later. The third lived one and one-half years.

Both of those treated by simple cautery and radium are living; one three years and the other four years after treatment.* It is thus apparent that in early cases the various types of treatment gave similar results; it remains for time to prove the durability of results wherein radium was employed.

In cases in Group 2 (Table III) the Percy cautery and radium yielded approximately the

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*In making a special sub-heading for those receiving cautery and radium, I am reducing the number treated by radium reported by Stacy in 1920.

TABLE V.
RESULTS OF VARIOUS FORMS OF TREATMENT IN INOPERABLE CASES.
GROUP 4

TREATMENT	Patients	Dead	Length of life known in	Living	Lived more than five years	Lived more than four years	Died in less than one year	Average length of life, years
Surgery........................	3	3	3	—	—	—	1	1.58
With simple cautery.........	5	3	3	—	1	1	—	3.00
With radium.................	7	5	6	1	—	—	2	1.50
With simple cautery and radium.................	1	1	1 } 16	— } 1	—	—	—	2.50
With Percy cautery..........	5	5	5	—	—	—	2	1.58
With Percy cautery and radium..................	1	1	1	—	—	—	—	2.50
Radium only....................	57	42	40	2	—	1	22	1.12
Percy cautery..................	32	25	22	—	—	—	17	0.70
With radium................	11	9	7	—	—	—	3	1.16
Simple cautery..................	9	8	7	—	—	—	5	0.66
With radium................	14	10	10	1	—	1	7	1.24
Total..................	145	112	105	4	1	3	59	1.08

TABLE VI.
RESULTS OF VARIOUS FORMS OF TREATMENT IN ADVANCED CASES
GROUP 5

TREATMENT	Patients	Dead	Length of life known in	Living	Lived more than five years	Lived more than four years	Died in less than one year	Average length of life, years
Surgery........................	1	1	1	—	—	—	1	0.91
With Percy cautery and radium................	1	1	1	—	—	—	1	0.83
Radium only....................	11	8	5	—	—	—	3	0.81
Percy cautery..................	11	9	9	—	—	—	8	0.50
With radium................	2	—	—	—	—	—	—	—
Simple cautery..................	7	7	6	—	—	—	5	0.58
With radium................	3	3	3	—	—	—	3	0.41
Total..................	36	29	25	—	—	—	21	0.58

same early mortality; the former method yielded one five-year cure and the latter one four-year cure. The combination of radium, cautery, and surgery in this group proved equally efficient to, if not slightly better than, surgery alone. The incidence of early deaths is higher, but four of of the seven are living while only nine of twenty-four wherein surgery alone was used survive.

Cases in Group 3 are of special interest. Of the five surviving patients all received surgical or combined treatment. The use of radium as an adjunct gave the best results; when used alone the results were disappointing.

In cases of Group 4, only patients who received radium alone or in combination survive. Seventeen of twenty-two on whom the Percy cautery was used died within the first year; while only twenty-two of forty on whom radium alone was used died in this period.

In cases in Group 5 radium again showed slight superiority over surgery in prolongation of life, only three of five patients died in less than one one year. Its palliative effect is universally recognized.

Fistulas resulted after treatment in forty-six cases, 9.7 per cent. of the entire series. There were twenty-one rectovaginal fistulas, thirty-five vesicovaginal, and there was one vesicosigmoidal fistula. The largest number followed Percy cautery, but this may be due in part to the fact that the abdomen was not always opened to control the uterus and to estimate the degree of heat.

TABLE VII

Length of Life of Patients under Various Treatment

Treatment	Patients	Length of life known in	Living	Living five years		Living three years		Died after three years
				Patients	Per cent.*	Patients	Per cent.*	
Total abdominal hysterectomy	25	24	9	7	30.4	9	39.0	4
Vaginal hysterectomy	29	23	9	7	30.4	9	39.0	4
Amputation of cervix	2	1	—	—	—	—	—	1
Simple cautery and later hysterectomy	15	12	5	3	25.0	5	41.0	1
Simple cautery and immediate hysterectomy	8	8	1	—	—	1	12.0	2
Total abdominal hysterectomy and radium**	15	14	6	—	—	6	43.0	—
Vaginal hysterectomy and radium	10	9	4	—	—	4	44.0	1
Simple cautery and total abdominal hysterectomy and radium	9	6	3	—	—	3	50.0	1
Simple cautery and vaginal hysterectomy and radium	5	4	3	—	—	3	75.0	1
Percy cautery and later hysterectomy	31	25	5	4	16.0	5	20.0	5
Percy cautery and immediate hysterectomy	13	6	1	1	16.0	1	16.0	—
Percy cautery and vaginal hysterectomy	3	2	1	—	—	1	50.0	—
Percy cautery, later hysterectomy and radium	7	6	1	—	—	1	16.0	2
Percy cautery, immediate hysterectomy and radium	10	5	1	—	—	1	20.0	—
Percy cautery only	81	57	2	2	3.5	2	3.5	3
Percy cautery and radium	17	9	—	—	—	—	—	1
Simple cautery	26	20	—	—	—	—	—	—
Simple cautery and radium	36	25	3	—	—	—	12.0	—
Radium only	133	91	6	—	—	6	6.7	4
Total	475	347	60	24	7.0	57	16.6	30

*Percentages in this table are based on cases wherein length of life is known. They thus favor small groups and those from which a large number are excluded on account of insufficient data.

**Radium was first used here in 1915.

CONCLUSIONS

1.—In very early cases of cancer of the uterine cervix treatment by surgery alone gives good results. Surgery in combination with radium gives slightly better results than surgery alone.

2.—In operable but not early cases treatment by surgery alone or combined with radium gives the best results. Radium alone or Percy cautery alone are of equal value and both less efficient. If radium is not available, Percy cautery should be used.

3.—In cases considered inoperable because of extension to the vagina surgery gives the best results and radium is disappointing.

4.—In inoperable cases radium, alone or in combination with cautery or surgery, is the only effective agent.

5.—In advanced cases radium is superior to all other methods but not curative.

6.—The incidence of fistula is higher with Percy cautery than with any other method.

NOTE.—Reports received subsequently credit another three-year cure to radium and an eight-year cure to vaginal hysterectomy in Group 1, and further establish the value of hysterectomy when supported by radium or Percy cautery.

ASTHMA IN CHILDREN

ALAN BROWN, M.B.

Toronto, Ont.

INTRODUCTION.

ASTHMA is characterized by sudden paroxysms of severe dyspnoea, accompanied by some signs of bronchitis of varying degrees and recurring at intervals of varying length. It is difficult to get from the literature any idea of the frequency of asthma in early life on account of the difference of opinions of various writers as to what constitutes real or true bronchial asthma. Dyspnoea of a more or less paroxysmal character is not an uncommon manifestation of bronchitis in infancy and as a result it is very difficult to decide in many such cases as to whether or not they are of a true asthmatic character. The symptoms in many cases may closely resemble the paroxysms of true asthma as seen in adults but from an etiological standpoint the condition is an entirely different one. The dyspnoea is not due to a primary spasm of the bronchioles, but is only a symptomatic manifestation of bronchitis in early life, its paroxysmal character probably being due to the excitability of the nervous system, which so often modifies the symptoms of disease in childhood.

True spasmodic asthma is not a common disease in early life, but it may occur at any age. Ashby met with a case at the age of eight weeks, in which the disease was distinctly familial, the father and an uncle of the patient having suffered from the same complaint. Cautley recorded one case which appeared to have been true asthma, which terminated fatally at the age of eleven weeks. As a rule, however, the affection does not manifest itself until after the age of two years. Reflex irritation may induce spasm of the bronchial tubes but certainly not true asthma. Perhaps the most common example of this is the spasm that results from the presence of adenoid growths in the naso-pharynx. Undoubtedly the removal of these will in some cases cure the tendency to bronchial spasm. It has accordingly been claimed that the removal of adenoid and tonsillar growths will cure asthma but this does not follow unless every case of spasm of the bronchial tubes is to be described as due to asthma. The recognition of this liability of the bronchial tubes to spasm from many diseases and from many sources is of the greatest importance if we are to have clear ideas as to the nature and treatment of true asthma in early life.

Etiology. Until recently, current views as to the etiology of asthma regarded the spasm as most probably a central neurosis of reflex origin. Under this view due prominence was given to the constitutional factor which must always be invoked to explain the occurrence of such a neurosis in certain individuals only. Undue prominence was given to the various possible sources of reflex irritation, which might act as precipitating causes for the attack. The disease was most generally regarded as due to the combination of a constitutional nervous excitability with reflex precipitating causes. The etiological factors so far as they are known, are the same in children as in adults. In the immediate family history there will usually be found gout, asthma, eczema, migraine, etc., and the various other manifestations of the so-called "Arthritic or neuroarthritic diathesis." In the production of attacks as well as in the cure of the disease, local surroundings, probably the atmospheric conditions, play a great part. The house surroundings, if of an exciting kind, will by disturbance of the digestive tract and nervous balance develop a tendency to asthma in a susceptible child which might have remained latent under a more placid up-bringing. The disease is not confined to any one class of society, although the well-to-do provide a larger proportion of cases and their habits of life tend to the propagation of the disease. The exciting cause of an attack may be unascertainable. In other cases it may be trifling, and would be negligible in a child not belonging to this group of children. A child who suffers from eczema in infancy, frequently will develop asthma or hay fever or cyclic vomiting in later childhood. The first manifestations of asthma very frequently appear during the second year, when the eczema has healed or is about to disappear, a clinical fact which not improperly permits the layman to speak of a "striking in."

The most tenable view as to the etiology of asthma is one which regards the condition as a manifestation of anaphylaxis. The essential feature is that the parenteral introduction into the body of a foreign protein leads to the development of a specific proteolytic ferment. The development of this substance is called "Sensitization" and the ferment is stored in the body cells until activated by a second introduction of the same protein. The rapid splitting of protein which follows a second injection may lead to the liberation of poisonous constituents of the protein. The evidence as to the association of asthma with anaphylaxis may be summarized as follows: It is generally agreed that asthma is due to a stenosis of the bronchioles. It has been demonstrated that in animals dying from anaphylactic shock, the cause of death is a stenosis of the bronchioles. From this viewpoint asthma is a manifestation of anaphylactic shock in an individual who has become sensitized to a particular foreign protein substance. As anaphylaxis is a peripheral phenomenon, asthma is also peripheral, not a central neurosis.

In susceptible children a paroxysm may be incited by high winds, dust, cold and damp air, or by the inhalation of substances such as the pollen of certain plants, especially ragweed, golden-rod and roses. Contact with animals, especially horses, cats and dogs may also and frequently do, incite attacks. It has recently been shown by Schloss and Talbot and also by Walker that as well as these emanations from animals and plants, that certain foods especially eggs and, rarely, milk, pork and other meats are responsible for attacks in certain children. Sensitization to egg albumen and other proteins may be shown by a cutaneous test, performed by scarifying and inoculating the skin in the same way as for the Von Pirquet tuberculin test. The phenomenon of horse asthma, in which the attacks develop when the subjects come into contact with horses has long been recognized. The sensitization of these patients may be shown by a positive cutaneous reaction with either horse serum or horse dander. The association of asthma caused by the pollen of particular plants, with a specific cutaneous reaction to this pollen has been demonstrated by Walker and others. Research is pointing out from time to time that other foreign substances are capable of producing sensitization in constitutionally susceptible individuals. In certain instances the susceptibility to these protein substances is inherited; in others it is perhaps the result of an active sensitization, but in many instances there is no sufficient explanation as to how the child has become sensitized.

Pathology. The opportunity to make post mortem examination, in other subjects than those animals who have died during an attack of asthma is seldom offered. Cases have been reported by Ellis who has reviewed the literature. The pathological picture is not uniform or characteristic of asthma. Redness of the bronchial mucosa, dilatation of the bronchi, and pulmonary emphysema are common. The medium and smaller bronchi are likely to be wholly or partially occluded by an exudate of mucous, which may contain a granular or an apparently fibrinous material, and intact or degenerated epithelium. Partly wound threads or spirals may also be observed. Polynuclear leucocytes, round, oval or spindle cells with or without eosinophiles and Charcot-Leyden crystals, may also be present. The epithelium of the bronchial mucosa may be intact or desquamated. The pulmonary alveoli may appear normal, dilated or atelectatic. Eosinophile cells were noted in the alveoli of Ellis' case, an adult.

Symptoms.

There are four different clinical types of asthma occurring in infants and children.

1. *Cases which in the beginning resemble acute bronchitis,*—this type is frequently seen in young infants. The onset is sudden with slight fever, incessant cough, dyspnoea, sometimes cyanosis and with prostration and cold extremities. The chest is filled with sibilant and sonorous rales which soon give place to fine crepitations. Contrary to the usual course of bronchitis, the attack subsides very abruptly and it is only by observing recurrent attacks that the diagnosis may be made.

2. *Catarrhal asthma or those following in the course of bronchitis.*

3 *True asthma.* This is not an uncommon form and is frequently classed under the heading of acute spasmodic bronchitis (Rachford and Kerley) or catarrhal spasm of the bronchi. The symptoms are however, indistinguishable from asthma and undoubtedly belong in this classification. This is the type that is more frequently met with in children. The attacks usually begin abruptly with moderate fever although frequently there is no thermal rise. The respiration may vary from fifty to eighty per minute. There is frequently severe dyspnoea, the facial expression is anxious, the infant frequently attempting to cling to anyone. Laborious and prolonged expiration is present whereby all the auxiliary muscles are strained and the active abdominal muscles in particular are severely taxed. The thorax itself is rigid or makes but slight excursions and inspiratory epigastric recessions occur; cyanosis and often cold sweats ensue. Respiration is frequently retarded. In addition to the prolonged expiration, dry, sibilant rales loud enough to be heard anywhere in the room may develop early or later. Auscultation reveals diminished respiratory murmur, with, in addition, numerous sibilant and sonorous, mostly expiratory rhonchi heard over the entire lung. Percussion yields a loud hollow note and will suggest a marked emphysema of the lungs, the border of which may extend to the eighth rib on the right side anteriorly. The pulse is small and usually accelerated. The temperature, on the other hand in pure asthma is normal. During sleep the dyspnoea abates. Cough is frequently absent in the beginning; but sets in towards the close of the attack when the secretion becomes somewhat more loosened, bringing to light in older children a tough, purely mucous expectoration, which in true asthma contains Charcot-Leyden crystals, Curschmann's spirals, and many oesinophile cells.

These attacks of asthmatic bronchitis may continue for three or four weeks, while they are constantly present they vary in intensity from time to time being usually worse at night. The symptoms are always increased by exposure to a cold, damp, atmosphere, by any fresh accession of bronchitis and often by trivial digestive disturbances. The cough is not usually severe and expectoration in most cases is absent in the bronchitic type. With recovery from asthmatic symptoms the emphysema usually disappears gradually, although in severe cases it occasionally is persistent. What proportion of asthmatic bronchitis cases go on to develop true asthma it is impossible to say, some undoubtedly do, but on the other hand many make a complete recovery. In true asthma the attacks may recur every week or so or be almost constantly present; frequently they recur after weeks or months of respite. The condition frequently disappears for years.

Asthmatic bronchitis in children is much more frequently met with than true bronchial asthma. There are individuals in whom every new attack of bronchitis (often febrile) immediately assumes an asthmatic character, i.e., it begins with sonorous rhonchi, moderate emphysema, and increased expiration. These asthmatic symptoms as previously mentioned gradually disappear with the resolution of the dry catarrh. These children frequently suffer from this kind of bronchitis once or twice a year; and in the intervals of freedom they are often somewhat short of breath and frequently have chronic nasal catarrh associated with a large amount of adenoid tissue.

4. *Hay Asthma* is a type of asthma which is

produced by a reaction of the nasal and deeper seated respiratory mucous membrane, to the pollen of various plants, etc. This predisposition is hereditary and is found in family neuroarthritismus. The disease sometimes commences at three to six years as a hay cold, and frequently remained unrecognized during the first years, if the conjunctivitis and the well-known predisposition do not lead to the proper diagnosis. Pronounced hay-asthma occurs as a rule, a few years later.

Diagnosis. Attacks of true asthma are usually easily recognized. The paroxysmal character of the dyspnoea, the prolonged wheezing expiration and the tendency to recurrence, form a sufficiently characteristic clinical picture. A positive diagnosis can almost invariably be made by an examination of the blood. In this condition the essential feature is an increase in the eosinophile cells. They average about ten to twelve per cent. of the total cells but may reach as high as twenty-eight per cent. (Holt). The examination of the sputum is only of importance in older children suffering from typical adult asthma; in these instances Curshmann's spirals and Charcot-Leyden crystals are present. The various forms of paroxymal dyspnoea seen in children are excluded principally by an examination of the blood. This, combined with repeated observations of the attacks, is the only means at our disposal of distinguishing true asthma from spasmodic bronchitis or bronchopneumonia in children. "Cardiac Asthma" and "Renal Asthma" have rarely to be considered in differential diagnosis. The spasms of the larynx seen in catarrhal laryngitis, produces paroxysmal dyspnoea inspiratory in character, associated with this however, is an inspiratory stridor and one will note the absence of rales in the chest. Thymic asthma is a condition associated with paroxysmal dyspnoea, but in it the prolonged wheezing expiration is absent, the breathing is not so labored, and the characteristic blood picture is not present.

Prognosis. The prognosis as regards life is good, provided that the patient can be well protected from the development of chronic bronchitis and emphysema. The prospect of a complete cure depends probably upon the ability to desensitize the patient to the particular plant, food, animal or bacterial protein or better still the removal of the particular protein from the diet or surroundings of the child. It is quite possible to take a hopeful view, and say that the young infant or child will "grow out of it." This may happen, more especiaaly in those cases in which the family tendency to the disease is not marked, and in which a spasmodic tendency has been manifested in the child in other ways. Very often, as the child grows, the tendency to asthma dies down, but only to be replaced by some neurosis, such as migraine, periodic vomiting or erythaema, especially is this true if they have not been desensitized properly to the particular causative agent.

Summing up then, the younger the child, the shorter the duration of the disease; and the less marked the hereditary tendency, the better the prognosis. In those children that are sensitive to the pollen of plants and to certain food stuffs there is reason to believe that specific treatment by immunization may be of benefit. The results with hay fever have been encouraging and Talbot was able to prevent or diminish greatly the attacks in some of his patients, especially those who were sensitive to egg.

Treatment—Until the last year or two we have known of nothing specific for asthma. Further study of anaphylaxis in the condition and in the same condition in animals may lead to more successful therapy. Heretofore the disease appeared to run its course but little influenced by the numerous measures suggested for its relief. New methods apparently successful in isolated or small groups of cases have repeatedly found a place in the literature, only to be replaced by other and still newer measures. A drug which appears at one time to have afforded relief may utterly fail at the next trial in the same or another patient. The more distressing features of the paroxysms can often be relieved by medication.

The tendency of modern medicine is to study the cause and the condition upon which pathological processes are based rather than burden the student with a long list of drugs with which to treat an illness. No disease can be treated intelligently without a clear understanding of its pathology and etiology and of the physiology of the patient. Asthma, like other diseases, was treated symptomatically and empirically until recent advances in medicine made it possible to determine its cause. The pathological explanation of asthma in childhood applies only to a small group of cases. The great majority have to be explained by other means. The treatment may be most conveniently dealt with under two headings.

1. *The attack.*—Inhalations of the fumes of nitre paper or stramonium leaves is the measure which should ordinarily be used in the acute attack. Most of the proprietary "Asthma Cures" contain these ingredients. The room in which the child is sleeping may be filled with the fumes or if a still greater effect is essential the fumes may be introduced into a regular croup tent. The cold air treatment in bronchial asthma is distinctly contraindicated regardless of the age of the patient. Warm, moist air at from 68° to 70° is best. A sudden blast of cold air may be sufficient to increase the severity of the paroxysms to a marked degree. Ventilation, however, is a necessity in these cases. The best means of obtaining it is by the use of two rooms, one of which may be aired while the other is occupied. Before the child is changed to the aired room its temperature should be raised to that of the other. Mustard plasters so applied as to envelop the entire thorax will often relieve the spasm sufficiently to reduce the respiration. The mustard should remain on long enough and be of sufficient strength to produce a good skin reaction. It is not necessary to repeat it more often than every three hours. When the attack is severe and accompanied by severe dyspnoea, adrenalin chloride (1-1000) 5 to 10 minims should be given hypodermically. The effect is almost instantaneous but unfortunately tends to pass off rapidly so that it may have to be repeated within an hour or an hour and a half.

It is rarely necessary to use either morphine or codeine in the management of asthma in children, for it so happens that the spasms are usually controlled by the use of epinephrin and by local applications. Many writers believe that the nocturnal attacks can be avoided or lessened in severity by giving at bedtime one of the nervous sedatives such as antipyrin or bromide. Personally, I have had little or no success with this form of therapeutics but there is no objection to trying these drugs in doses proportionate to the age of the child. In order to avoid all possible sources of reflex irritation the physician should make sure that the bowels are thoroughly open and if any doubt exists on this point, an enema should be given at the beginning of the attack, and the bowels should be kept open during the subsequent period.

General treatment of the disease. In 1910, Meltzer suggested that bronchial asthma might be due to anaphylaxis, because of the striking similarity of its clinical symptoms in man to those in animals rendered sensitive by injections of small doses of protein. Before any further advance could be made in the subject, a safe method of determining whether a patient was hypersusceptible to a foreign protein had to be devised. In 1873 Blackley found that pollens caused a reaction on the scarified skin of individuals suffering from hay fever. The importance of this observation was not recognized or applied until recently. In 1912 Schloss described skin reactions obtained with egg protein in patients susceptible to eggs. This method has been adopted by Talbot and in employed as follows:—A linear scarification is made about one half inch long and only deep enough to penetrate the outer layers of the skin, care being taken not to draw blood. Another scarification is made as a control, since it is a well established fact that mechanical injury to the skin may result in a pseudo-reaction (an elevated white area surrounded by a small roseola) especially in patients with an "exudative diathesis." The scarification is then inoculated by applying the material to be tested, preferably in fresh solution and allowing it to remain there for twenty minutes. In some instances, however, reaction may be delayed and may not appear for one or two hours. It may be described as an urticarial wheal with an irregular outline surrounded by a pink blush, both of these phenomena being absent in the control. In some cases the blush, without the urticarial wheal is so pronounced and characteristic that there is no question about the reaction. Itching may or may not be present. A positive reaction usually disappears within one-half to two hours. The more delicate the skin the more readily will a foreign protein pass through it, and if the patient is sensitive, will cause a reaction. An infant's skin reacts very readily and even when unbroken is capable of absorbing the foreign protein in some instances. The skin test is specific, and indicates sensitization to the protein tested if the protein used in the test is free from chemicals, and therefore not in itself irritating to the skin, but at the same time maintains its protein characteristics. Information derived from such a test may be of the greatest aid in determining the cause of bronchial asthma. According to

Talbot, asthma and its allied conditions have naturally divided their cause into three groups as follows:

1. Inspiratory type due to—
    - a. Hay fever—pollens of various grasses.
    - b. Animal emanations.
        - (1) Horse, dog, cat's hair, dust.
        - (2.) Bird's feathers.

2. Ingested type due to—a, meat; b, milk; c, eggs; d, grains, oats, wheat, etc.; e, vegetables, peas, beans, potatoes, etc.; f, fruits, oranges, banana, etc.; g, nuts, walnut, pecan, etc; h, fish, salmon, etc.; i, shell fish, lobster, crabs, clams, etc.

3. Bacterial type. The occurrence of the different types of asthma varies with the age of the patient. Infants and young children are only sensitive to ingested proteins, such as milk and eggs and other common articles of food. This type gradually becomes less common as the individuals grow older, as there is a tendency for natural immunity to develop with age. On reaching puberty sensitization to foods either becomes relatively uncommon or the patient learns by experience to avoid certain articles of food which are apt to disagree. Inspiratory asthma, on the other hand, is not found before the third or fourth years of life, and becomes more common as the patient reaches puberty. Bacterial asthma is relatively rare in children, but becomes more common in adult life. The treatment of bronchial asthma depends upon the type of asthma, the exposure and the severity of the symptoms. If the asthma is of the ingested type the bowels should be cleared out by calomel, milk of magnesia or salts. Such a procedure will remove the immediate cause of the attack and thus shorten the duration. Permanent cure can only be attained by finding and removing the cause. This may be done by means of a very careful history and by the skin test described above. The proteins may be prepared according to the methods of Walker and Woodhouse, although pure untreated proteins give usually satisfactory results.

Inspiratory Asthma. Patients suffering with hay-fever may either be immunized by subcutaneous injections of the pollen extracts to which he is sensitive, a procedure not without danger except in the hands of an expert, or he may seek a locality free from the offending weed, plant or tree thus avoiding exposure during the flowering season. The same applies to horse asthma. If immunization is not practiced the patient should be excluded from all emanations from the horse such as horse hair, mattresses, etc.

Ingested Asthma. Asthma due to foods is more difficult to deal with than the inspiratory asthma, since it is not always easy to eliminate entirely an article of food from the diet without starving the child or making the diet monotonous. Eggs are the most common cause of this type of asthma on account of their extensive use in cooking, and since minute quantities are sufficient to cause an attack of asthma, careful planning is necessary to give a child an egg-free diet. The following foods usually or always contain eggs; custard, cakes, frostings, cookies, many ice-creams, puddings, some crackers and macaroni. The difficulties of keeping eggs entirely out of the diet therefore, makes it necessary to induce an artificial immunity according to the method of Schloss. This is done by giving the child minute doses by mouth of dried egg white powder in gelatin capsules. The initial dose of egg, which is usually one milligram is gradually increased until the patient receives from eight to twelve grams of egg powder a day. By the time the dose is as high as three or four grams of egg a day the severity of the asthma has usually diminished, the child begins to gain in weight, and looks more like a normal child of its age. Immunity which occasionally is permanent is established when the skin test becomes negative. Not infrequently, however, after the immunizing doses of egg are omitted, the symptoms and a positive skin test return. To prevent this, the usual technique, according to Talbot, is to give the maximum immunizing dose during the first week of every month for at least one year after the child is immunized.

Idiosyncracy to beef juice or the other meats is handled by excluding the offending meat from the diet. Fortunately idosyncracy to beef juice tends to cure itself in a few months without treatment if the beef juice is omitted from the diet.

Idiosyncracy to the vegetables but more especially to the grains is difficult to treat because if all the grains were excluded from the day's food it is almost impossible to give enough carbohydrate for a well balanced diet. In most cases it is wise to exclude entirely the offending food. Biologically the vegetable proteins are closely related to one another, so that a child who is sensitive to the protein of the string bean will often react to the other members of the bean family, that is to the lima bean, pea bean, black bean, etc. The same is true of the grains, wheat, barley, oat, rye, etc., which belong to the grass family. When positive reactions are obtained from the seeds of the grains, the pollens of the grasses may also react.

Milk forms such an important part of a child's diet that it is very difficult to exclude it entirely. Individuals to whom raw milk is a poison may be given boiled milk or buttermilk with good results. Sometimes it is necessary to produce immunity to cow's milk by giving drop doses of the milk, gradually increasing the amount and obtaining immunity in the manner described for eggs. The remaining foods, fruits, nuts, fish, and shell fish will not be missed, if they are excluded from the diet.

Climate. With the new conception of the etiology of asthma it will scarcely be necessary to seek this form of relief unless it be to avoid the particular inspired protein or to cure the frequently associated bronchitis. An assurance of relief cannot be promised for any climate, and yet a change of location is sometimes successful in preventing recurrences. City is often better than country life. A change from one place to another near by may be as beneficial as a change to a resort far away. Patients whose financial condition will permit may well try one location after another. In general a mild and equable climate is to be preferred, and Florida, Southern California, the Riviera and Egypt may be favorable for poorly nourished and neurasthenic patients: some may be benefitted by a stay in a well regulated sanitarium.

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Effect of Quinidin on Striped Muscle.—Experiments made by J. G. Brody, Cleveland, with frog's gastrocnemius or sartorius, immersed in dilute quinidin solutions, show the following variations from the corresponding normal muscle (immersed in unpoisoned Locke's solution): (1) The height of contraction is diminished. (2) With tetanizing current, the peak of contraction is not so well sustained. (3) The muscle ceases to respond to any stimulus much sooner than the corresponding unpoisoned muscle.

(4) Load fatigues it more easily. (5) About ten stimulations a second cause a completely fused tetanic contraction in normal muscle; but with the quinidin muscle, the fusion is usually incomplete, no matter how frequent the stimulation, and becomes less and less complete the more the muscle is fatigued or loaded. (6) The quinidin muscle, therefore, responds intermittently to a tetanizing current. These effects can be conceived as depression of the muscle; slow recovery of excitability, and consequent failure to respond to rapid stimulation, until the muscle has rested; therefore, intermittent response to frequent stimulations, the rhythm of the contractions depending not on the frequency of the stimulation, but on the rate of recovery of the muscle. In consequence of the rest, the contractions are strengthened. This seems to furnish a plausible explanation of the effect of quinidin on auricular fibrillation.—*Jour. Am. Med. Assoc.*, July 29, 1922.

MERITS OF INTRAPERITONEAL INJECTIONS IN INFANTS

T. D. McGregor, M.D.

St. John, N.B.

THE parenteral injection of fluids has always been a rather difficult procedure and one often attended with a certain amount of risk. Until recently we have been dependent upon subcutaneous or intravenous routes. While hypodermoclysis is a ready means of introducing fluid, the rate of absorption is slow and only comparatively small amounts can be introduced at one time. Intravenous injection involves a difficult technique on account of the small size of the veins and here too, the amount of fluid that one can safely inject is small. The need of some ready means of injecting considerable amounts of fluid into tissues or cavities where rapid absorption is assured has long been felt, and, if one may judge from reported investigations, the intraperitoneal route meets these requirements.

The highest rate in infant mortality is found in diseases associated with marked dehydration, the summer diarrhoeas for example. It is in these cases that we frequently meet with the problem of introducing into the circulation large quantities of water to combat fluid loss. The sunken eyes, sunken abdomen, depressed fontanelle and inelastic skin all direct attention to the extreme desiccation. With these symptoms there is high fever, rapid and feeble pulse and respiration; not infrequently the infant is in a stuporous condition. Even water is rejected by the stomach so the infant receives no fluid to compensate for the loss of tissue-fluids caused by the diarrhoea.

Despite the fact that no food is entering the digestive tract the body chemistry goes on and there is increased metabolism as a result of the restlessness and high fever. The fuel must be obtained from the stored-up foods in the body, the glycogen and the fats. If the disease goes on there is finally a destruction of the proteid tissues. The dehydration results also in a concentration of the solids in the blood and a decreased blood volume. There also occurs an excessive loss of alkalies, especially potassium and sodium. The kidneys are unable to perform their function properly on account of the concentration of the blood and so toxic products accumulate and are absorbed. This diminished alkalinity together with the accumulation of toxic acid products may lead to a condition of acidosis. The high temperature is probably the result of a combination of causes; the toxic absorption, the increased metabolism and the dehydration.

In these cases an essential feature of treatment is the early administration of water. Ordinarily we have at our disposal five methods: 1. By mouth. 2. By bowel. 3. Subcutaneously. 4. Intravenously. 5. Intraperitoneally. The vomiting prevents the administration of fluid by mouth and the bowel is in such a condition of intolerance that rectal injections are of little value so that we must inject the fluid into the veins, under the skin or into the peritoneal cavity.

Subcutaneous Injections. Hypodermoclysis is always painful. In these cases where we have extreme desiccation there is usually a varying amount of shock and it is questionable whether we are justified in submitting such a child to the pain of multiple punctures for the sake of introducing four or five ounces of fluid into the tissues.

Intravenous Injections. Until the suggestion of employing the superior longitudinal sinus was first proved practical, intravenous routes were little used on account of the difficult technique. The veins are small and hard to enter but easy to penetrate. In wasted infants, on account of the diminished blood volume, the veins are in a semi-collapsed condition and the difficulty is increased. Entering the longitudinal sinus presents certain difficulties; there is always the possibility of infiltrating the tissues outside the vein if the needle becomes dislodged or transfixes the vein; even in the most skillful hands this method is painful. The rule that one-sixtieth of the infant's body weight may be injected is generally accepted.

Intraperitoneal Injections. That absorption takes place from the peritoneal cavity has long been recognized but it has only recently been shown that large quantities of fluid are absorbed sufficiently rapidly to make this an effective means of introducing fluids into the system.

In 1914 Dandy and Rowntree injected dye solutions into the peritoneal cavities of dogs and found the dyes appearing in the blood stream in from two to four minutes and in the urine in from four to six minutes. In 1918 Blackfan and Maxcy first advocated the employment of the intraperitoneal route for the administration of fluids to dehydrated infants. Since that time much experimental work has been done to prove the safety and practical value of intraperitoneal injections.

Technique. For injection a syringe or funnel and rubber tubing may be employed, the former being easier to manipulate. As a precautionary measure the urinary bladder should be palpated. The midline below the umbilicus is the customary point of entry but any part of the abdominal surface may be chosen provided there is no solid viscus underlying it. A needle with a moderately blunt tip may be employed although it has been proven that it is practically impossible to perforate the bowel by the sudden insertion of a needle. The use of too large a needle is often followed by troublesome oozing at the point of entry. As a rule about four to eight drachms per pound body weight may be injected in babies under one year. If distention be marked a smaller amount may have to be employed and extreme distention contra-indicates any introduction of fluid. It is never advisable to inject more than ten ounces at one time. During injection the respiration and circulation should be carefully watched and the introduction of more fluid stopped if any embarrassment occurs. After the injection there may be cyanosis and other symptoms of undue pressure if too great an amount of fluid has been introduced. This can usually be relieved quite readily by reinserting the needle and withdrawing a sufficient amount of fluid to lessen the pressure. Injections may be repeated twice daily. If small amounts are used and absorption is rapid this interval may be shortened. The disappearance of the abdominal distention which usually follows the injection indicates that absorption is sufficiently far advanced to permit a second injection. It is generally admitted that absorption is complete at the end of twenty-four in the average case. Injection is often followed by a slight rise in temperature, probably due to what has been termed a sterile inflammation since stained smears of fluid aspirated after injection show that there is an inflammatory reaction of the peritoneum (a chemical peritonitis).

The solutions employed vary with the indications; those most used are: Normal saline solution, 6 per cent. dextrose in normal saline, 6 per cent dextrose in distilled water, 2 per cent. sodium bicarbonate solution, and 2 per cent. sodium bicarbonate solution with dextrose. Milk has been injected by some workers and others have tried the injections of oils but definite data on these experiments are not available.

Death Following the Administration of Thymol.—Milford E. Barnes, Bangkok, Siam, reports two fatal cases following the administration of thymol for the relief of hookworm infestation. The majority of patients treated with thymol show some signs of its toxic action, such as flushed face, slight dizziness, and drowsiness. The symptoms usually disappear rapidly after the administration of the final purge. In some countries the drug is dispensed to the patients, who are permitted to take it in their own homes without medical supervision. This practice is not followed in Siam, where the entire course of treatment is personally administered by the medical officer in charge or by his trained dispensers. These rules have been adopted for the administration of thymol: (1) A preliminary small dose of magnesium sulphate is taken by the patient the evening before treatment. (2) No breakfast is permitted on the day of treatment. (3) At 7 a.m., 20 grains (1.3 gm.) of thymol mixed with an equal amount of lactose is administered in capsule. (4) At 9 a.m., an additional dose of 20 grains of thymol is given. (5) At 10 a.m., a final purgative dose of magnesium sulphate in hot water is administered.—*Jour. Am. Med. Assn.*, Sept. 16, 1922.

SEPTIC ABSORPTION IN DIFFUSE SEPTIC PERITONITIS

W. A. Costain, M.B.,

Department of Surgery, University of Toronto.

IN septic peritonitis septic absorption determines the life or the death of the patient, and it is absolutely necessary that this vital process be thoroughly understood. We must know definitely how and through what structures the septic products of peritonitis enter the blood stream, in order that the treatment based on this knowledge may give better results. The theory of septic absorption from the peritoneal cavity has been the outcome of extensive experimentation by numerous observers working through many years. Practically all the experimental work has been with a view to the establishment of the normal channels of absorption. The general method adopted has been to inject certain fluids into the peritoneal cavity of a normal animal through the anterior abdominal wall, and then to study the avenues of absorption. The fluids included saline, soluble dyes, colloid silver, lamp black, bacteria, milk, Chinese ink, blood, oil, egg yolk, etc., and the animals employed were frogs, guinea-pigs, rabbits, cats and dogs.

In 1863 von Recklinghausen[1] found that such fluids as milk, Chinese ink, egg-yolk, oil and blood passed into stomata of the diaphragmatic lymphatics. Schweigger-Seidel[2] in 1866–7 made similar findings. Tourneux[3] in 1874, and Ranvier[4] in 1875, failed to find such stomata. Kolossow[5] in 1892 denied their existence. Beck[6] in 1893 found that blood was absorbed through the thoracic duct. In passing, I wish to point out that numerous anatomical variations occur in the thoracic duct, according to Piersol[7] and that a single duct opening into the venous system at the juncture of the left subclavian and jugular veins does not always occur. Muscatello[8] in 1895 failed to find diaphragmatic stomata. Durham[9] in 1897 found that free bacteria were rapidly absorbed through the diaphragm into the anterior mediastinal glands. In 1903 MacCallum[10] definitely showed that the leucocytes were responsible for absorption through the diaphragm into the anterior mediastinal glands. He also demonstrated that granules were able to pass between tissue cells at points. Hertzler[11] in 1903 described the encysting in the peritoneum of particles of lamp black. Buxton and Torry[12] in 1906 upheld Durham's findings. Dandy and Rowntree[13] in 1913 concluded that the diaphragm plays no special rôle in absorption as they found involvement of the abdominal as well as the mediastinal glands, after injecting a solution of carmine with suspended particles into the peritoneal cavity. Thiele and Embleton[14] in 1914 regarded absorption through the mediastinal glands as quite secondary. They found rapid absorption through the thoracic duct. Bolton[15] in 1921 concluded that large molecules are absorbed through the diaphragmatic lymphatics into the anterior mediastinal glands, and thence to the right lymphatic duct.

These findings have to do mostly with the lymphatics, and are so conflicting that one gains the impression that the problem is still unsolved.

Absorption into the blood stream through the subperitoneal capillaries has been studied as widely. Starling and Tubby[16] in 1894 studied this problem by injecting saline with diffusable dye into the peritoneal cavity through the anterior abdominal wall, and with a catheter in a ureter and drainage from the thoracic duct, found the urine stained in five minutes and the lymph in half an hour. Orlow[17] in 1895; Hamburger[18] in the same year; and Dandy and Rowntree[13] in 1913, confirmed these findings. Bolton[15] in 1921 found that colloids pass slowly into the blood. Poisonous or other substances, whether formed by bacteria or otherwise, may be directly absorbed into the blood, provided they are not large molecules.

From this experimentation one would conclude that absorption occurs directly into the blood vessels from the peritoneal cavity and into the lymphatics of the diaphragmatic region. Experiments in the past have a point of possible error which may account for the diversity of the findings; it is the mode of introduction of fluids into the peritoneal cavity. The peritoneal cavity is a potential space, and fluid injected into it, provided the quantity is not in sufficient amount to distend the whole cavity and the cavity is not opened, acts in the same way as when injected into tissues elsewhere. It becomes encysted. When the great omentum forms a more or less complete apron covering over the intestines in front, as it does in the dog or cat, an injection of fluid through the anterior abdominal wall will form a cyst corresponding in size to the quantity of fluid injected. The cyst has the parietal peritoneum for its anterior boundary, and its posterior boundary is the great omentum, while the peritoneal cavity proper remains uninvolved for a considerable period of time. Obviously, in such a condition, absorption is upwards towards the diaphragm. This fact was demonstrated in a dog studied before a fluoroscope. Fifty centimetres of a twenty per cent. solution of sodium bromide was injected through the middle of the right rectus muscle, into the peritoneal cavity of a fox terrier, while the dog was held in the dorsal position before a fluoroscope. The fluid was seen to form a round cyst immediately under the abdominal wall, and notwithstanding the movements of the dog the cyst remained unchanged over a period of fifteen minutes. The accuracy of the injection was verified by opening the abdomen. Besides this possible error in the experimentation, there is also the fact that in the presence of a peritonitis the normal processes of absorption appear to be altered. Hertzler[19] states that an abundant fibrinous exudate all but stops absorption. Wegner[20] in 1877 found that intra-abdominal pressure increases absorption, provided it be not sufficient to retard the return blood flow.

In view of the diversity of experimental findings, the possible error in the introduction of the fluids employed, and the uncertainty of the applicability of the routes of normal absorption to the conditions which pertain in diffuse septic peritonitis, more convincing experimental facts are required. In an attempt to solve this problem and find the channel of septic absorption I have carried out a series of experiments on dogs in the laboratories of the Committee on Medical Research in the University of Toronto. It was decided to first set up a diffuse septic peritonitis and then study the absorption which led to the death of the animal. Dogs were employed on account of the similarity between the abdominal anatomy and that of the human, and also because of the size of the thoracic duct. The appendix was chosen as the organ in which to start the pathological process, as in diffuse septic peritonitis it is most often the starting point of the disease. The first step in the experimentation consisted in establishing a set method of producing a fatal peritonitis. When it is possible to produce a uniform pathological lesion which results, in each case, in a fatal peritonitis it is then possible to judge the efficacy of any subsequent experimentation which prevents such a fatal termination. Such a method of causation would be acceptable as a lethal standard. The lethal standard was found in a series of seven dogs. The abdomen was opened under ether anæsthetic and the appendix exposed. A double chromic catgut ligature was tied firmly about the base, and a second about the meso-appendix, completely cutting off the blood supply to the organ. The appendix was then returned and the abdomen closed. Nothing further was done and all the dogs died in about forty-eight hours. The post-mortems revealed that death was due to acute toxaemia. The appendix had become gangrenous, and before sufficient walling off could take place, had ruptured into the peritoneal cavity. There was a diffuse septic peritonitis with abundant bloody exudate. The thoracic duct fluid simulated in color that found in the peritoneal cavity, and contained free bacteria peculiar to the dog, leucocytes and endothelial cells filled with bacteria, crenated red blood cells and debris. This finding determined the character of the subsequent experiments. The plan for the second series of experiments was to induce peritonitis by ligating the appendix, then to expose the thoracic duct and ligate it also, so as to block that possible source of septic absorption. This series consisted of eleven dogs, and the following procedure was carried out in each case: The dog was prepared in the usual way for an aseptic abdominal operation and for exposure of the thoracic duct at the root of the neck. Ether was given to the surgical degree and the abdomen opened through the right rectus. The appendix was found and the stump and mesoappendix ligated separately with chromic catgut. The appendix was then returned and the abdomen closed. A dry gauze collodion dressing was applied. A four inch vertical incision was then made along the posterior border of the left sterno-mastoid, extending about one inch below the upper border of the left pectoralis major. The latter muscle was divided to that extent. The sterno-mastoid was retracted inward, exposing the jugular vein, which was drawn outward. The carotid artery and vagus nerve were held inward, and the oesophagus followed downward until the thoracic duct was encountered. A strand of plain catgut was used to ligate the duct. A single piece of plain gauze was inserted down to the point of ligation. The pectoralis was restored and the wound loosely closed. A dressing was applied to provide for drainage. The operation was done almost entirely by blunt dissection to avoid bleeding, and care was taken not to dissect so deeply as to enter the mediastinum.

The first dog recovered and was normal in three weeks. At the end of seven days, when the abdominal symptoms were subsiding the abdomen was again opened, and the presence of a resolving diffuse septic peritonitis verified. Small particles of tissue, mixed with a purulent exudate and scattered throughout the peritoneal cavity, were all that remained of the appendix, and the stump of that organ was closed over by a piece of omentum. The abdomen was then closed and the dog made an uninterrupted recovery. Three other dogs of this series recovered, nothing being done after the first operation, except the removal of the gauze in the neck. In the four dogs which recovered it was noted that a fistula of the thoracic duct had occurred, allowing of free drainage of lymph from the neck wound. The character of the lymph draining from the duct could not be ascertained on account of the septic condition of the wound.

In those which died the post mortem revealed a number of causes of death. The most noteworthy fact was that not one of them had developed a fistula of the thoracic duct. The causes of death may be classified in the following way:

1. Surgical emphysema and the shock of the double operation. When the mediastinum was entered at the time of the operation surgical emphysema rapidly spread down toward the diaphragm, compressing the thoracic organs. In one case it spread down to the pelvis retroperitoneally.

2. The establishment of a collateral flow of lymph. It was found that a collateral flow of lymph is readily established. The exact course was impossible to determine.

3. An error in ligating the duct. In one case it was found at post mortem that a large branch from the head and neck had been mistaken for the duct.

In a third series of seven dogs the attempt was made to overcome these causes of death. As all of the cases which recovered showed a fistulous thoracic duct, this fact was utilized to prevent the infective material from entering the blood stream and at the same time to drain it from the system. Next, to prevent or lessen the shock, the operation was divided into two stages. On the first occasion the appendix was ligated. Twenty-fours later the duct was exposed and a fistula established. The procedure was as follows: Under ether anæsthetic the appendix was ligated in the usual way and the abdomen closed. Twenty-four hours later the dog was again anæthetised and the thoracic duct exposed and ligated. An opening was then made in the duct on the abdominal side of the ligature. The ligature was left long and the ends brought out and attached to the skin so that later, if lymph clots occurred at the opening of the duct, gentle traction on the ligature would tend to dislodge them and keep the duct draining. The wound was lightly drained with plain gauze and partially closed.

Three dogs recovered. They all had duct fistula. Of the remaining four three died from a collateral flow of lymph, the operation failing to produce a duct fistula. The fourth died from pneumonia resulting from aspiration of vomitus at the second operation. In the dogs which recovered, drainage from the duct usually stopped gradually during the second week, the wound then quickly healed and the dog rapidly gained the weight lost as a result of the fistula. The thoracic duct was examined after a period of two months and a collateral circulation found in the lymph stream below the site of operation.

The pathology and bacteriology found in the second and third series was fairly constant. The appendix had become gangrenous and had ruptured before sufficient walling off had taken place to convert it into an appendiceal abscess. A diffuse septic peritonitis had occurred in about forty-eight hours. The peritoneal fluid was found to contain a great variety of bacteria, leucocytes, endothelial cells and tissue debris. The lymph glands from the root of the mesentery were loaded with bacilli; showed intense inflammatory changes; and there were many leucocytes and endothelial cells present. The thoracic duct contained fluid resembling that in the peritoneal cavity, both in the gross and microscopically. The duct fluid when incubated for forty-eight hours, teemed with bacteria, usually a rod-shaped bacillus predominating, and the leucocytes and endothelial cells were becoming colonies of growth. The blood culture from a fatal case was positive while that from a recovery was negative. The liver was acutely congested, but culture from the liver tissue was negative. The adjacent organs were all acutely congested. The small intestine showed extensive inflammatory involvement. The lymph nodules of the lower ileum had enlarged to a great extent, sending prolongations into the lumen between the epithelium. These prolongations harbored colonies of rod-shaped bacilli which were not seen elsewhere on the epithelium. These colonies were seen to extend up into the lymphatic tissue beyond the epithelial coat.

Summing up the results of the experimentation, we find that seven dogs recovered after the production of the fatal peritonitis by successfully causing a duct fistula and thus preventing the lymph from entering the blood. They recovered, in spite of the fact that the cause was not removed and no resort was made to abdominal drainage. The infection in the peritoneal cavity had no outlet, save through the duct, and when this outlet was available the result was recovery. If a fatal septic absorption could occur directly into the blood through the subperitoneal capillaries, or through the diaphragmatic lymphatics and thence through the right lymphatic duct into the blood, these dogs which recovered would have died, for nothing was done to prevent such absorption.

The practical application of these findings has yet to be worked out. It would seem that the first procedure, after a diagnosis of diffuse septic peritonitis had been made, would be to establish a thoracic duct fistula, and at a later date whatever other operative measures which the situation warranted. The operation could be done with greater facility in the human than in the dog, as the duct is more accessible and, being larger, could be more successfully drained. The emaciation could be combatted by blood infusions or transfusions. By checking the septic absorption, those distressing complications which are met so frequently in peritonitis would be largely overcome. The conclusion to be drawn from this experimentation is that in diffuse septic peritonitis death travels through the thoracic duct.

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Treatment of Hyperemesis Gravidarum by the Duodenal Tube.—The deduction drawn by Charles E. Paddock, Chicago, (*Journal A.M.A.*, May 27th, 1922) from his case are that, by the applied use of the duodenal tube in early stages of hyperemesis gravidarum, the necessity for emptying the uterus for this disturbance may be reduced to a minimum. This method of treatment not only relieves the concern about the loss of life to the mother, but secures the life of the fetus as well. While, in the treatment, the passing of the tube is comparatively simple, still, to insure the best and quickest results, the co-operation of the patient with the physician is necessary. After the tube has settled into place—it takes from four to twenty-four hours—the rest of the cure is simple. The principal indications for the use of the tube are the loss of weight (due to starvation) or the dehydration of the tissues, in other words, the depleted condition that arises from excessive vomiting, of hyperemesis gravidarum.—*Jour. Amer. Med Association*, July 22nd, 1922.

POST-OPERATIVE MANAGEMENT*

R. V. B. Shier, M.B. (Tor.) F.A.C.S.

Toronto, Ont.

THERE has always been an impression among practitioners that once an operation is completed, fully seventy-five per cent of the surgeon's worry is over. Only those physicians who have had the post-operative care of a troublesome case will realize how far this is from being correct. This phase of our surgical therapy has been sadly neglected in undergraduate teaching, so much so that a large number of us when we graduated have had but a hazy idea of what to do, let alone make a diagnosis of our patient's difficulties.

Success in surgery depends on three things; surgical diagnosis, surgical technique, and post-operative care. All three perfected tend to lower mortality rate. To-day we shall endeavor to lay down some fundamental principles in respect to the last of these. There is, first of all, one axiom that I would like to state as follows: It is much easier to prevent post-operative complications than it is to cure them. With this as our ideal, we have been able to revolutionize our post-operative care.

There are three main troubles that are apt to beset every abdominal case; 1. Pain. 2. Distention. 3. Nausea and vomiting.

In regard to the treatment of post-operative pain, there is in our opinion only one answer, and that is enough morphia to keep the patient free from pain and restlessness. This may require ¼ grain with atropine 1-150 grain for the first twelve hours, or it may require three times that much. Patients differ so much in nervous temperament and susceptibility to pain. However, keep them free from pain for the first twenty-four hours, and little morphia will be required thereafter, unless the case is one of general peritonitis, when much more will be required. If the patient complains of pain in the second twenty-four hours, one should investigate the cause of the pain before ordering morphia indiscriminately. Pain in this period may be due to pylorospasm, which is readily relieved by atropine; to a distended bladder which may be relieved by an enema or catheterization, preferably the former; the pain may be of pleuritic origin, or finally, distention, which can be relieved by heat locally and other measures, such as the various enemata.

Distention, or the second difficulty, can be prevented absolutely in eighty per cent of cases. The essentials tending towards prevention are, digitalis per rectum immediately after operation, morphia to relax rectus spasm and allow of painless contraction to expel gas, and strychnine; and lately to the armamentarium we have added sodium bromide. The question arises, why give digitalis per rectum? We have only one answer, and that is that it surely does prevent distention in some way; a case of "rational empiricism." For the rest, we can only theorize that it has (1) a direct action on the unstriated muscles, (2) an action on the vagus nerve, (3) it puts general tone into the whole cardio-vascular tree. The last seems as likely as any, since shock, with its consequent venous engorgement, must be one of the underlying factors in inducing the condition. Strychnine we use for its action on the smooth muscle fibres, and the bromide as an additional sedative. Therefore we prevent these two post-operative troubles, pain and distention, with the following routine order, to be used in practically all abdominal cases:

Atropine gr. 1-150 } p.r.n. for pain.
Morphia gr. ¼ }
Strychnine gr. 1-30 q.4.h. for 48 hours.
Murphy Drip oz. 6 of glucose 10% and concentrated tr. digitalis drm. 1½ (B. & W.), and sodium bromide gr. 80.

We are insistent no purgative be given within the thirty-six hours prior to operation, and that patients receive abundance of fresh cold water. We are not enthusiastic about ice water. We absolutely forbid ginger ale, orangeade, or grape juice, feeling that these only add to the patient's discomfort. It is a habit with some nurses to be too enthusiastic regarding enemata. Use enemas only when necessary.

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*Read at Ontario Medical Association Meeting, Toronto, June, 1922.

In order to treat nausea and vomiting, it is essential to diagnose the type. There are five types: (1) anaesthetic, (2) gastric dilatation, (3) obstructive, (4) neurotic, (5) toxic.

Anaesthetic vomiting is fast disappearing. Certain remedies may be tried, such as peroxide of hydrogen, one drachm in saline, drachms 6, or adrenalin minims 30 in aqua oz. 1, or milk of magnesia or bismuth. *In giving any of these, it is important that the stomach be empty.* If the patient is vomiting clear water, the likelihood is that such emesis empties the organ, but if bilious material is vomited, nothing but gastric lavage will determine whether or not the stomach is empty.

The vomiting of gastric dilatation occurs most frequently after—(1) Cholecystectomy, (2) Removal of large ovarian cysts, (3) Abdominal tumors, (4) Splenectomy; it is characterized by the repeated vomiting of small quantities of foul smelling olive green material. There is only one thing to do, and that is repeated gastric lavage, either with an ordinary stomach tube or duodenal tube and the right side position. Obstructive vomiting is much the same in character as that of dilatation, only of later onset. The neurotic type occurs in people overwise about anaesthetics, such as nurses, doctors, and those who have been anaesthetized before. As a rule the sight of a stomach tube, and 100 grs. of sodium bromide per rectum speedily effect a cure. *Any vomiting of the anaesthetic type which persists for over twenty-four hours is either of neurotic or of toxic origin.*

The toxic vomiting is indeed a serious affair. It occurs in patients with acidosis with acetonuria, in patients with thyrotoxicocis, and in cases of prostatic hypertrophy with a high N.P.N. in the blood. Always examine the urine for acetone. If present, give plenty of glucose 10% and soda 5% per rectum by drip, or glucose 5% interstitially, or glucose 10% intravenously. In any case get fluid into the tissues. The vomiting of thyrotoxicosis, after packing the patient in ice, is best relieved by diluted hydrochloric acid in 5-10 minim doses by mouth, and bromide per rectum. This also relieves the nausea after deep Coolidge X-ray therapy.

This concludes in a brief outline the essentials in an ordinary case. You will see that we aim at *rest* and *comfort* and *abundance of fluids.* However, there are complications in some cases. In an analysis of some 400 cases in the early part of 1921, I find the following complications with their percentage occurrence:—Acute dilatation of the stomach, 2 per cent; Pneumonia, 10 per cent; Cystitis, 3 per cent; Phlebitis, 1.1 per cent; Pylorospasm, 1.5 per cent.

The occurrence of post-operative pneumonia is influenced by several factors. It occurs in about eight per cent. of abdominal cases, six per cent. in above the umbilicus and two per cent. below, and very frequently in perforated gastric and duodenal ulcers. It occurs in the base of the right lung in ninety per cent. of the cases, and if recognized in the first twenty-four hours, can be aborted by appropriate treatment in eighty per cent. of cases. Apparently the anaesthetic has very little to do with its occurrence; neither has the mode of its administration. The theory that it is due to multiple emboli seems the rational one, but several factors favor its development. Atmospheric conditions seem to be the predominant factor. In dull, damp weather, pneumonia is very common, while on clear, bright days it is very rare. The frequency in the right lung as compared with the left is evidently due to the splinting of the right side of the diaphragm. I can recall but one case following breast amputation. How do we recognize it? By suppressed breath sounds and a few crackling rales. Dullness may or may not be evident. It is usually present. This constitutes pneumonia in its early stage.

In our treatment we may be regarded as old-fashioned, but we are not ashamed of the allegation. We apply mustard and linseed poultices, continuously or intermittently, but sufficient to produce and maintain counter-irritation. By mouth we give quinine grs. 3 to 5, ergotin grs. 2 every four hours until the temperature is normal. If this fails, which it seldom does, to abort a pneumonia recognized at its inception, and consolidation proceeds, the pneumonia follows the usual course of any broncho-pneumonia.

Phlebitis is an annoying disturbance to a convalescent patient. It is of course most common after pelvic surgery, and has a tendency to appear in epidemics. Its occurrence means a month or six weeks delay in allowing the patient up out of bed. The treatment, in addition to a Thomas splint which swings free above the mattress, is to lay along the course of the femoral vein hot lead and opium compresses. This removes the tenderness and pain more speedily than any other local application. The patient's stay in bed should be ten days after the temperature is normal in the evening.

Cystitis does occur, no matter how carefully catheterization is carried out. As a preventive measure it is a good plan to leave two or three drachms of 5% argyrol solution in the bladder after catheterization. Do not use the argyrol stronger than 5%. If it is necessary to catheterize a patient for some days, the oral administration of urotropine is worthy of trial.

I regret that we have no specific for hiccoughs. At times they are easily stopped, at others nothing at our command seems to have the slightest influence. Gastric lavage is one of the first measures to adopt. Various remedies may be used if the hiccoughs continue after the stomach is empty, e.g. aromatic spirits of ammonia, chlorodyne in milk of magnesia or bismuth, dilute hydro-chloric acid, sodium-benzyl-benzoate, iced champagne, or buttermilk. The multiplicity of remedies indicates their uncertainty of action.

Pylorospasm is a distressing ailment. The patients suffering from it are as a rule complaining of epigastric pain of varying degree of severity and continually endeavoring to belch gas. It is always wise to advise a patient against the usually useless procedure of belching. These patients are as a rule nervous, and are air swallowers. Atropine gr. 1-100 per hypo. repeated in two hours and sodium bromide gr. 100 per rectum usually bring speedy relief. If the pain is severe, a moderate dose of morphia may be given with the atropine.

In conclusion I would like to state that many distressing complications may be avoided by simple measures; e.g. in elderly people chewing gum will prevent a painful parotitis. Always allow the patient to take the most comfortable position in bed. Careful attention to a host of minor details always leads to a satisfied patient, and a satisfied patient is a real asset to any surgeon. If the attendant is master of the situation, by his personality and knowledge of post-operative management, he will have gone far towards shelving a host of his worries.

LOCAL ANAESTHESIA AS APPLIED TO OPERATIONS ON THE RECTUM AND ANUS*

Alfred J. Grant, M.D.

Instructor in Surgery, Western University Medical School; Attending surgeon to Victoria Hospital, London, Ont.

PERHAPS one of the greatest causes of bodily discomfort among our people, in all walks of life, is some one or other of the minor surgical affections of the rectum and anus. In the great majority of cases the symptoms are periodic, seldom causing the patient to take to his bed, and this fact, together with the fear of a general anaesthetic, usually causes the patient to resign himself to a life of torment unless the symptoms become sufficiently violent to drive him into seeking relief. Haemorrhoids, fissure of the anus, fistulo in ano and benign neoplasms represent the most common of such conditions and all may be handled under local anaesthesia with the use of proper technique.

In no other region of the body are we called upon to use such faultless technique because of the abundant nerve supply and it might be well just at this point to briefly point out the arrangement of the sensory nerve fibres involved. The nerves of the interior of the rectum are simply part of the sympathetic system supplying the remainder of the intestinal tube. That the ordinary nerves of sensation are absent is well demonstrated by the absence of pain in the early stages of carcinoma of the ampulla. The anal canal, on the other hand, is profusely supplied with sensory nerves and tactile corpuscles are numerous. The nerve supply of the region about the anus as well as that of the anal canal comes from three different sources and this point is worthy of careful consideration when working with local anaesthesia. The pudic nerve, by its perineal and inferior haemorrhoidal branches is the chief supply but the ano-coccygeal nerves from the pudendal and coccygeal plexuses as well as the perineal branches from the posterior cutaneous of thigh, a branch of the lumbar plexus, contribute quite freely to the bountiful supply of sensory nerves in this region.

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*Read before Lambton County Medical Association.

You will thus see that we have a perfect network of sensory nerve filaments surrounding the anal canal and unless we succeed in blocking sensation from every quarter we are liable to have pain at some stage of the operation. Imperfect anaesthesia is most embarrassing to the surgeon, to say nothing of the patient's feelings and we should always strive to have the entire procedure absolutely painless. That such a state of affairs is possible in this region has been questioned by many workers with local anaesthesia. With the elimination of the occasional patient who is unsuitable for any local procedure, the use of Braun's method, which I will endeavor to describe, has always been highly satisfactory in my hands We have already shown, by the arrangement of the sensory nerves, why bilateral blocking of the trunk of the pudic nerve will not completely anaesthetize the anal canal. Neither will bilateral injection of the ischio-rectal space, although this procedure is more far reaching than simple blocking of the pudic nerves because the perineal branches of the posterior cutaneous of thigh are included in the latter method.

There is a large measure of psychology in every operation under local anaesthesia. Well adapted instruments must be at hand, including fine-gauge, sharp needles and good, easy-working syringes. Since the patient is not being subjected to the risk of a general anaesthetic there is no reason for a demonstration of speed on the part of the surgeon. Quiet, careful, sharp dissection, without unnecessary traction on the parts, contributes in no small degree towards a painless operation.

Technique for the anaesthetization of the anus and anal canal. A solution of ½% anocain combined with 1-100,000 epinephrin makes a very satisfactory anaesthetic for this region. Select points 1, 2, 3, and 4, each about ¾ inch distant from the margin of the anus and forming the corners of a square. Commencing at point 1, with a 25 gauge needle make a wheal by intracutaneous injection of the skin. Pass the needle in the direction of point 2 in the subcutaneous tissue, always keeping a flow of solution distending the tissues ahead of the needle. Before withdrawing the needle, make another wheal at point 2, by injecting into the skin from within outwards. This assures a painless entry of the needle at point 2 for the anaesthetization of the line from 2 to 3. A similar wheal is made at three, while the injection to point 4 may be carried out from the original injection at point 1. Thus the only inconvenience to the patient has been the initial prick and this is reduced to a minimum by the method described. The next step is the deep injection, using a 2½ inch needle of 23 gauge and commenced by inserting the left fore-finger in the rectum until the tip is just beyond the internal sphincter. In many irritative conditions of the anus the introduction of the finger is quite painful. This may be alleviated by placing a pledget of cotton soaked in 10% cocaine solution just within the folds of the external sphincter and allowing the same to remain in position while the superficial injection is being carried out. Four punctures are made in the now fully anaesthetised skin, at points 1, 2, 3 and 4 aiming at the tip of the finger which has already been introduced beyond the internal sphincter. Solution is expelled ahead of the needle as before, until the point is felt immediately next to the finger in the bowel and separated from it only by the mucous membrane. About 10 C.C. of solution is usually sufficient for each one of these deep injections. A wait of five minutes should now be the rule in order to give the anaesthetic an opportunity to do its work.

The above technique is ideal for haemorrhoidectomy and as we have already intimated that a correct operative technique is necessary for a painless operation, let us consider a few points in this connection. I have long since reached the conclusion that the wide dilatation of the external sphincter which is generally practiced as the first step in this operation, is entirely unnecessary and I believe that such a procedure should be preserved for one's enemies. The post-operative distress with which we are all only too familiar is due almost entirely to this violent tearing of the anal outlet. A very slight spreading of the external sphincter is often necessary but it is frequently quite possible to roll out the anal mucous membrane by means of four Allis clamps placed at the four points of the compass and so expose the pile bearing area without any dilatation. Any type of radical operation may be done by this method of anaesthesia but it is quite easy to cause the patient pain if we insist upon placing two brawny thumbs within the anus and widely separating the same. My regular procedure consists of the regular ligature operation, being careful to damage the mucous membrane of the anal canal as little as possible. The only dressing used is a cone shaped plug of gauze, well vaselined and held firmly against the anus by a tight fitting T-bandage. The placing of a tube in the anal canal is quite unnecessary and causes the patient a great deal of discomfort. These operations are usually done in the office and the patient returned to his home in a taxi where he remains for a few days without a bowel movement spending most of his time in the reclining position. They rarely have any post-operative distress and it often requires argument to keep them off their feet until the bowels are moved.

Radical operation for fistulo in ano and fissure do not require a complete blocking as above described. The anaesthetization of a wedge shaped sector of the anal region, including the diseased area, is quite sufficient but the deep injection must be carried above the internal sphincter at the sharp point of the "wedge." This method is also effectual for the excision of benign neoplasms.

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PLASTIC SURGERY OF THE HEAD AND NECK

FULTON RISDON, M.B.

Toronto, Ont.

IN private practice, the cases needing plastic surgery are:—*burns,* where considerable contraction has resulted; *deformities* due to motor accidents, or loss of cartilaginous or bony support of the nose due to lues or tuberculosis; *loss of function* of the seventh nerve (facial paralysis); and *congenital* deformities such as hare-lip and cleft palate.

There are two types of deformity following burns, one from loss of tissue, and the other where dense fibrous bands have formed in the process of healing. In the *former,* frequently the result of electrical burn, an entire lip may be lost, or most of the nose, and these deformities are markedly lessened by plastic surgery. If a lower lip has been lost, a new lip with vermillion border may be supplied by incising completely through the cheek on the same side, including the mucous membrane. This flap is then brought into its new position and sutured, observing the same care in suturing the mucous membrane as the skin. In reconstructing the *nose,* first a lining is obtained for the reconstructed nose from the adjacent tissue by turning the skin surface under, and a forehead flap obtained to cover this raw area. It may be necessary to supply cartilage subsequently, and this may be obtained from the costal cartilage, preferably from the seventh rib.

In treating the ordinary contractions following severe burns of the face, as a rule the eyelids are markedly everted and fixed. To overcome this ectropion, incisions are made parallel to the Tarsal cartilages of the upper and lower eyelids from the inner canthus to the outer, and leaving if possible a slight bridge of tissue between the two incisions; at any rate, seldom should an incision be made across the inner canthus. The undermining of both of these incisions is as complete as possible and then Thiersch or Wolff grafts are used to cover the raw surfaces. Some men sew the eyelids together at this time and leave them for six months, but in my opinion this is seldom necessary. To avoid this, the graft, if full thickness is used, may be sutured into position, and if thin or Thiersch, may be wrapped around some dental compound and buried in each incision, to be removed in six to eight days. Where a contraction has occurred in the socket of an enucleated eye, this dental compound may be used as above described inside the socket to reproduce the Fornix. Speaking of enucleated eyes—and this has nothing to do with burns—the sunken appearance may be overcome by making an incision into the capsule and implanting cartilage. This greatly assists in giving free movement to the artificial eye. It is frequently necessary to reconstruct a cheek or part of the neck, due to fibrous bands holding the chin against the chest, and this is overcome by using skin from the chest on a pedicle.

Frequently cases present where the entire septum of the nose has been lost, and after treatment the Wassermann may be negative. This saddle-backed deformity can be improved with cartilage taken from the seventh rib and implanted in the nose, forming a new bridge and columeller support. This is a very satisfactory operation to the patient, as the bridge can be reformed without any noticeable scars. Two incisions may be used, one in the columella with free undermining, using blunt-pointed tenotomy knives, or across the glabella between the eyebrows.

In treating the congenital deformities, especially the hare-lip and cleft palate, the greatest of care must be exercised. I believe that surgeons should realize more fully the responsibility of treating these cases. There is one golden opportunity when thinking of results, and that is at the first operation. Many conditions must be considered,—health of patient, age, time of speaking. and whether or not bone-approximation is to be attempted. I believe that if the separation is wide in the single hare-lip and cleft palate case, pressure to close this gap in the anterior region should be used in the form of lead plates and wires,—but this must be attempted before the fourth month. The lip may be closed any time after the gap has been closed. I know that the pressure from the lip will sometimes approximate the fissure, but no bony union is obtained. The time to do the palate, I believe, is about the fourteenth month, provided the general condition is good, or before the child tries to speak. In this operation for closing the cleft in the palate, lateral incisions should seldom be necessary as properly placed lead plates and tension sutures will allow for the closure. I am well aware that this is tedious and tiresome to accomplish, but in the field of surgery one must be a slave to detail. The after-treatment is very important, namely, as little food as possible for the first few days and the stitches kept dry or as free from moisture as practicable.

Recently I have attempted to overcome the effect of facial paralysis on the eye by the use of fascia from the hip, suggested by Gallie of Toronto. This fascia is introduced below the level of the inner canthus, carried subdermically across the upper lid to the external canthus and slightly below it, and attached, if possible, to the periosteum. This converts the condition into a ptosis, if sufficient tension is produced by attaching this strip of fascia to the periosteum in the region of the external canthus. At first the patient cannot raise the lid, but with practice he can elevate it high enough for visional purposes. I have done only two, one eight months ago. and to date they show improvement.

There is another type of deformity that one sees following severe injury to the face, and that is large loss of bone from the mandible, leaving the chin and lower part of the face in a bad position. We have found that a free autogenous bone-graft from the crest of the ilium is of great service, as the bone consolidates quickly and any size graft may be obtained.

HELIOTHERAPY IN SURGICAL TUBERCULOSIS*

R. I. Harris, M.B.

Fellow in Surgery, University of Toronto.

IT is probable that a belief in the beneficial action of sunshine has existed in the minds of men for centuries. Nevertheless it is only within comparatively recent years that sunshine has been used consistently as a therapeutic agent. On this continent for various reasons we have been somewhat slow to adopt its use, so that heliotherapy is here comparatively little known. For this reason I have thought it of interest to report the results of its use in a group of cases of surgical tuberculosis, the more so since these results appear to be a decided improvement over those obtained by previous methods of treating such cases. For the sake of clarity, I must preface my report with a brief outline of the physics of light, the physiological action of light, and the present status of heliotherapy.

Physics of Light. Light from any source consists of etheric vibrations of various wave lengths. It is customary to measure these wave lengths in millimicrons; one millimicron being one one-millionth of a millimetre. The nature and action of any particular kind of light are dependant upon its wave length. Rays of wave lengths between 780 and 380 millimicrons penetrate the eye, stimulate the retina, and are perceived as visible light. The effect upon the retina of the longest of these wave lengths is to produce the light-sensation we designate as red. The effect of the shortest visible wave lengths is to produce the light sensation of violet. Between these two extremes, rays of intermediate wave lengths produce the familiar gradation of colour seen in the spectrum. Beyond the longest visible red rays are others of still longer wave lengths which produce no effect upon the retina, but which we perceive as heat. Hence they are termed heat rays, or infra-red rays. Beyond the shortest visible violet rays are others of still shorter wave lengths, which cannot be perceived by the retina, but which are capable of producing very definite reactions, the most familiar of which is the photo-chemical reaction utilized in photography. These are ultra-violet rays. Light from various sources consists of mixtures of rays of various wave lengths, the mixtures being constant for each particular source of light. Sunshine (Fig. 1) contains rays of wave lengths varying from about 1300 to 290 millimicrons (the infra-red limit varies due to absorption by water vapour in the atmosphere). Sunshine contains, therefore, in addition to visible light rays, considerable quantities of heat rays and ultra-violet rays. Most of the physiological effects of light are produced by the ultra-violet rays it contains.

Physiological Action of Light. The physiological action of light may be summarized briefly, since our knowledge on this subject is fragmentary. The most important of its actions are those upon the skin, upon metabolism, and upon bacteria.

The action of light upon the skin is more accurately known than any of its other physiological effects. Here, as elsewhere, the important effects are produced by ultra-violet rays. Three phenomena occur, viz.: erythema, pigmentation, and vaso-dilatation. The erythema produced by light is of the nature of an inflammatory reaction. It makes its first appearance several hours after exposure, and may reach any degree up to extreme vesication, depending upon the length of exposure, the intensity of the light, its richness in ultra-violet rays, and the amount of pigmentation present in the skin of the patient. Under the name of sunburn, this erythema is, of course, familiar to us all. Under certain circumstances a similar inflammatory reaction may be produced in the conjunctiva (e.g. the production of snow blindness by reflection of sunshine from the snow.) If the skin is repeatedly exposed to light for periods of insufficient length to cause marked erythema, it rapidly develops an increased amount of pigment. This appears to be a protective mechanism for the defence of the organism against ultra-violet rays. The rate at which the increased pigmentation is acquired, and the intensity it reaches, vary greatly with individuals. Blondes pigment poorly; brunettes rapidly and to a marked degree. There is some evidence to make one believe that a certain parallelism exists between the degree of pigmentation and the benefit to be derived from heliotherapy. Rollier is strongly of the opinion that only those patients who pigment well show marked improvement under sunshine treatment. In addition to erythema and pigmentation, light produces a dilatation of the capillaries of the skin which persists for a long time. It is most easily observed in patients who, after exposure to sunshine for considerable lengths of time, are withdrawn from such treatment (e.g. during the winter). In such patients the pigment gradually fades. The skin is then seen to be uniformly pink, due to capillary congestion. This ruddiness of the skin persists for long periods of time.

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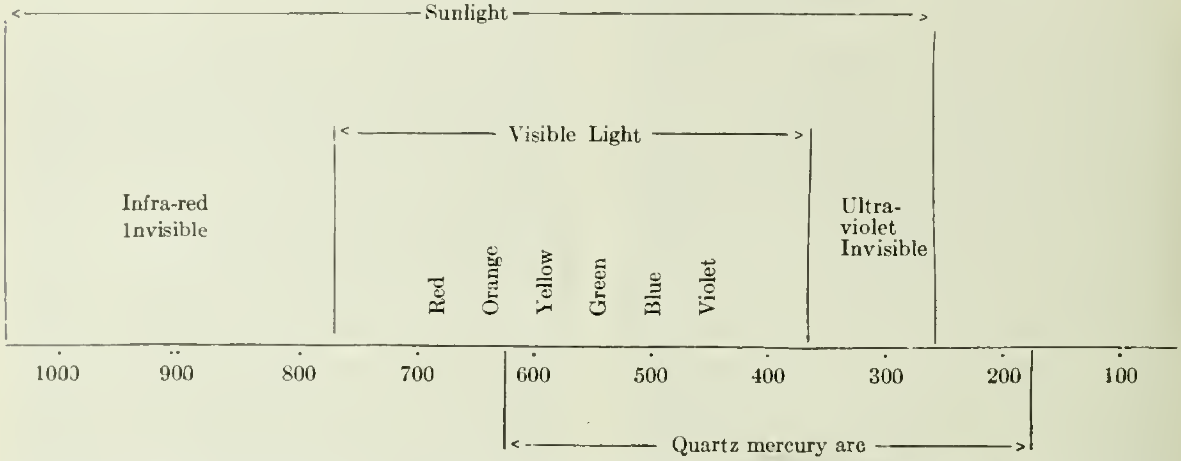

FIG. I.—Graphic representation of the visible and invisible light rays, their position in the spectrum, and the range covered by sunlight and by light from a quartz mercury arc. Figures represent wave-lengths in millimicrons, one millimicron = 1/1,000,000 millimetre,

By some means with which we are not yet familiar, light is able to produce changes in metabolism. In treating patients with sunshine, one cannot fail to notice the marked improvement that takes place in their general health; their appetite improves, they look ruddy and healthy, and they have a sense of mental well-being which is very striking, though it is difficult to define. Recently one phase of this metabolic action has been investigated by workers in the problem of rickets. Hess has shown that under the influence of light alone (either from the sun or from a quartz mercury arc) the phosphate content of the serum of rachitic infants rises rapidly from the low level characteristic of this disease, to the normal level, or even higher. Coincident with this rise in the phosphate content of the serum, the bony lesions are cured by the deposition of new bone. This can be clearly seen by a series of radiographs. That these changes are effected through metabolic processes, and not by the action of the light directly upon the diseased epiphyseal lines, has been demonstrated by the cure of wide-spread rickets by exposure of only a portion of the body to the light. Hess records such a cure produced by exposing only one arm to sunshine. It seems probable that this metabolic action of light is most important from the therapeutic standpoint, a point which will be discussed more fully later.

Light is markedly bactericidal. It has been repeatedly shown that its efficiency as a lethal agent on bacteria is proportionate to its content in ultra-violet rays. For this reason artificial sources of light rich in ultra-violet rays are more efficient sterilizing agents than is sunshine.

In addition to the above physiological actions, light produces a well-marked lymphocytosis. The mechanism and significance of this action is unknown. There is also an obscure and interesting phenomenon known as photodynamic sensitization, the discussion of which does not appear to belong to this paper.

Heliotherapy. The use of light as a therapeutic agent dates from 1896, when Finsen established his Light Institute in Copenhagen for the treatment of lupus. Since that time light in various forms has been used for a variety of pathological conditions. In 1903 Rollier opened an institution at Leysin for the treatment of surgical tuberculosis by means of sunshine. Rolner's reports have done much to popularize sun treatment, especially in Europe, and from such sources a large amount of empirical information has been accumulated which forms the basis of our present knowledge of this type of treatment.

Naturally enough, sunshine was the first kind of light used therapeutically, and is still, on the whole, the most satisfactory form. A belief that the beneficial action of sunshine is due to its content of ultra-violet rays led to the use of artificial sources of light rich in ultra-violet rays. Finsen's lamp was a carbon arc, the rays of which were concentrated by lenses, and cooled by the interposition of a stream of water. Practically all the substitutes or attempted improvements upon sunshine are electric arcs of some type. The ultra-violet ray content varies with the kind of electrode used to form the arc. A carbon arc emits light containing rays of wave lengths down to 300 millimicrons; an iron arc down to 240 millimicrons. Both these forms of light, for best effects, must be used naked (i.e. without the interposition of glass, since glass filters out the ultra-violet rays.) Probably the source of artificial light best adapted for this purpose is a mercury arc enclosed in a quartz cell, because of the fact that quartz is permeable to rays of wave lengths down to 150 millimicrons. There are some objections to such artificial sources of light, the gravest of which is their primary cost. This limits the number of lamps available, and this in turn limits the amount of exposure which can be given to each patient. In addition they do not exactly reproduce the effect of sunshine. The therapeutic action of sunlight cannot be explained by ascribing it simply to the ultra-violet rays it contains.

The empirical knowledge accumulated since Finsen first commenced using sunshine for the cure of lupus, indicates that light is of value in the treatment of certain forms of tuberculosis, in certain skin conditions, in rickets, and perhaps in certain forms of wounds.

Tuberculosis of the skin responds readily to treatment by light. The demonstration of this by Finsen marked the beginning of heliotherapy. Its widest field of usefulness, however, is in the treatment of tuberculosis of bones and joints. It has been the observation of nearly every user, that in this particular form of tuberculosis, light has a striking and almost specific effect. It is stated to be of value in certain forms of soft tissue tuberculosis, notably tuberculous peritonitis and renal tuberculosis. It is contra-indicated in pulmonary tuberculosis, because of the frequency with which it produces haemoptysis. This is due probably, to the congestion of the lung which is known to occur after exposure to light.

Superficial pustular skin infections, such as acne, are cured by exposure to sunshine. Rollier records an interesting observation in connection with the action of light upon the skin. An epidemic of chicken-pox occurred at his sanitarium at Leysin. He observed that those patients who were completely exposed to sunshine had no rash. Those patients whose bodies were partially covered by plaster jackets or spicas developed a rash only on the protected areas. The rash stopped at the line marking the limit of the tan. Rollier regards this as an evidence that the pigment itself is an agent capable of protection against disease.

The most interesting advance in the use of heliotherapy has been its application to the treatment of rickets. The seasonal incidence of rickets has long been noted. It is a disease of winter. One of the theories of its origin, now overshadowed by the more striking vitamine-deficiency theory, is that it is due to confinement and bad ventilation. Whatever the cause of this disease, it has been abundantly proven that a cure can be obtained with certainty by exposure of the patient to any source of light containing ultra-violet rays. Hess records several cures in which exposure to sunshine was the only treatment. Tisdall has produced similar cures by exposure to light from a quartz mercury arc. Experimental evidence confirms these clinical cures. Rats fed on a diet which invariably produces rickets in controls, can be protected against the onset of this disease by exposure to sunshine or ultra-violet light. Not only is a cure of the bony lesions of rickets effected by means of light, but the disturbed metabolism is returned to normal. During active rickets the phosphate content of the serum is markedly decreased. Under treatment by sunshine it rapidly rises to normal, or to an even higher level.

Clinical Cases. Four years ago there was established at Christie Street Hospital, a small roof ward for the treatment of certain cases of Pott's disease. The results obtained were considered sufficiently encouraging to warrant expansion of the ward and the institution of heliotherapy as a routine treatment for surgical tuberculosis. The results obtained from this treatment are the basis of my paper.

Up to the end of 1922 there were treated in this ward sixty-one cases of tuberculosis of various parts of the body other than the lungs. I have divided these cases into two groups depending upon whether the focus was in bones or soft tissues.

A.—Bone tuberculosis—49 cases.
  36 cases of Pott's disease
  6 cases of hip joint disease
  2 cases of tuberculous knee
  3 cases of sacroiliac disease
  1 case of tuberculous shoulder
  1 case of tuberculous sternum.
B.—Soft tissue tuberculosis—12 cases.
  6 cases of tuberculous peritonitis
  1 case of tuberculous adenitis
  1 case of tuberculous kidney and cystitis
  1 case of tuberculous appendicitis
  1 case of tuberculosis of skin
  1 case of tuberculosis of thigh
  1 case of tuberculous empyema.

Treatment. These patients were all treated in a similar manner. The usual orthopaedic principle of rest was instituted by relieving the tuberculous focus of movement and weight bearing. Patients with Pott's disease were placed in bed, on suitable Bradford frames. Cases of cervical and high thoracic Pott's disease were given additional fixation by means of a halter and weight extension applied to the head. Most of the cases of high thoracic and low lumbar Pott's disease had a spinal bone-graft operation performed during the period of recumbency, on account of the difficulty of fixing the spine in these locations by any type of brace. In the cases of hip joint disease and tuberculous knee, fixation was provided by means of plaster casts, combined with recumbency in bed. The cases of soft tissue tuberculosis were also kept in bed. All the patients were given a diet rich in milk and eggs, and were encouraged to take as much food as possible.

In addition to these usual orthopaedic measures, each patient was exposed to sunshine. Exposure was commenced gradually. The patients were stripped of all coverings with the exception of a towel over the genitals. They were then exposed to sunshine for 20 to 30 minutes the first day. This exposure was increased each day by 15 minutes, until pigmentation was attained. Once well tanned, they were exposed to the sun all day. Both back and front of the patients were exposed, care being taken to maintain fixation of the diseased part while the patients were turned on their abdomen. During the four summers in which this ward has been open, it has been possible to commence sun treatment in May and continue it into October. During May and October there are many days in which it is too cold and stormy to permit exposure of the whole body, but in spite of this there remain about five months in which one can count on complete exposure on every sunny day. In Toronto and in an industrial and therefore smoky section of the city, the number of hours of sunshine available for exposure is surprisingly high. During the past summer the average exposure of patients who were on the ward all summer was 535 hours each.

In administering sun treatment, certain precautions add greatly to the comfort of the patients. Heat in the middle of summer is sometimes troublesome, and if excessive, may be even prostrating. This is particularly true in solaria situated on the tops of buildings, the gravel roofs of which reflect a tremendous amount of heat. It is always well to provide means of keeping the patients' heads shaded: otherwise they suffer from headache and dizziness. Smoked glasses are useful as the glare sometimes produces conjunctivitis. Abundance of cool drinks, and an electric fan to provide a breeze should a natural one fail, are essential. On the hottest days we have sometimes had to move the patients into the shade, though as a matter of fact, the patients have felt the heat much less than the staff. A few cases of minor heat stroke occurred, as evidenced by headache, restlessness and sleeplessness, but these have been relieved by a few hours in a cool shaded place. On very hot days an elevation of temperature is occasionally seen. Certain patients appear to have an idiocyncrasy which makes them respond to sun exposure by a fever. In one patient, at the Lakeside Home, heliotherapy had to be abandoned because an hour's exposure produced a pyrexia of 103.4°. This is unusual. Blonde patients must be watched carefully. They tan poorly, and cannot stand long exposure on hot days. They also lose their pigment rapidly, and after three or four cloudy or rainy days, again have to go through the process of acquiring a new coat of tan.

By June, under the above treatment, the patients were usually thoroughly tanned, and from then until October they received four to six hours' exposure each day. Those patients whose symptoms subsided and remained quiescent were allowed up, wearing some type of appliance to keep the diseased part at rest. They commenced with thirty minutes out of bed each day, and gradually increased this allowance. A careful watch was kept for symptoms indicative of recurrent activity in the focus. While convalescent they continued their sun treatment.

Cured	*Apparently Cured*	*Improved*	*Unimproved*	*Died*
No signs of activity Increase in weight Have been up 6 mos. to 2 years without recurrence	No signs of activity Increase in weight Are still in bed or have been up only a short time	Still show some signs of activity though much better than on admission		
23 cases including 12 multiple foci 12 sinuses 1 paraplegia	12 cases including 3 multiple foci 5 sinuses 1 paraplegia	10 cases Nine of whom are recent admissions	1 case	3 cases 1 miliary tuberculosis 2 amyloid disease

FIG. II.—Table summarizing Results in Cases of Bone Tuberculosis.

Results of Treatment. The results, as far as bone tuberculosis is concerned, have been very gratifying. The 49 cases in this group may be analyzed as follows: (A) twenty-three cases are *cured.* By cured I mean they have no evidence of active disease, and their general health is excellent. Sinuses have dried up and are now healed. Abscesses have disappeared. They have no muscle spasm or pain. They have all put on weight. The average gain in weight in this group from the outset of treatment to discharge has been fifteen pounds. They have all been up for periods varying from six months to two years. Most of them have gone to their homes, and are engaged in occupations compatible with their physical capacity. None of them have shown any signs of recurrence. This group includes thirteen patients who had tuberculous sinuses, twelve patients who had multiple foci of tuberculosis, and one patient who had paraplegia.

(B) Twelve cases are *apparently cured.* By this I mean they now show no sign of activity, no muscle spasm or pain; sinuses, if formerly present, have healed; but they have either been up for a short time only, or are still kept in bed as a precautionary measure. There has been an average increase in weight of ten pounds. They are cases of shorter duration than the first group. They include three patients who had multiple foci of tuberculosis, five patients who had sinuses, and one patient who had paraplegia.

(C) Ten patients are *much improved,* though they still present signs of active disease. Three have sinuses which are steadily diminishing, five have still some muscle spasm, one has a small abscess, and the condition of one is obscure. In addition to thoracic Pott's disease he has chronic pulmonary tuberculosis and marked hypertrophic pulmonary osteoarthropathy. Nine patients in this group are the most recent arrivals in the ward.

(D) One patient is *not improving.* He has tuberculosis of the hip joint with multiple sinuses which are secondarily-infected. His temperature is septic and there appears to be a danger of amyloid disease.

(E) Three patients have *died.* All three were in a hopeless condition on admission. One had miliary tuberculosis and two had multiple, secondarily-infected tuberculous sinuses with amyloid disease. If we exclude these three cases who were hopeless on admission, the results in forty-six patients may be summarized as follows: cured or apparently cured thirty-five cases; improved ten cases; unimproved one case.

The results in cases of soft tissue tuberculosis do not appear so gratifying, though the number of cases is too small to draw certain conclusions.

Six cases are *cured.* One case is *apparently cured.* Two cases are *improved.* Two cases are *unimproved* (one of extensive renal and vesical tuberculosis and one of advanced peritoneal tuberculosis). One case has *died,* (advanced tuberculous peritonitis who was moribund on admission.)

FIG. III.—Patients receiving Heliotherapy.

Consideration of results. The results have been much better in cases of bone tuberculosis than in cases of soft tissue tuberculosis. It is of course difficult to know just how much of this result to attribute to sunshine. In the present state of our knowledge of the action of sunshine, any conclusions we draw as to the results of heliotherapy must of necessity be empirical. Approach to accuracy can only be obtained by comparison of large series of cases treated by sunshine with similar series treated without sunshine. My contact with these cases leads me to feel that bone tuberculosis is cured more certainly and more rapidly if heliotherapy is added to the usual methods of treatment. The beneficial action of sunshine was well illustrated by a small group of cases who occupied the ward during the first summer it was open. They almost all had multpile foci of tuberculosis, with discharging sinuses. During the summer they improved, the sinuses closed, and they put on weight. In October it was necessary to move them off the roof to an inside ward. Their treatment there was the same in every particular except that they had no sun exposure. None of them continued to improve during the winter. About half of them held their own, and in the spring were in the same condition as when they left the roof the preceding fall. The remaining half suffered relapses. Their sinuses broke down; they lost weight and their temperature became elevated. This continued until it was possible to put them in the sunshine again. Almost at once they began to improve, and in two months' time were very greatly better. This effect of sunshine upon surgical tuberculosis appears to be produced through the agency of the patient's metabolism. It is impossible to believe that a sufficient number of the sun's rays can penetrate into the depths of a focus of Pott's disease and exert a bactericidal action there, or that exposing the mouth of a sinus in the thigh due to a psoas abscess, can have any effect on the carious process in the thoracic vertebrae. The action of sunshine appears to enhance the resistive powers of the patient, and enable him, by this means, to overcome the focus of disease; hence the rationale of exposing the whole of the patient's body, front and back, in order to permit the greatest absorption of sun's rays. The favorable action of sunshine in cases of bone tuberculosis as compared with soft tissue tuberculosis, may perhaps be explained by the recent work in the problem of rickets. As has been mentioned before, it has been demonstrated that sunshine is capable of causing the deposition of new bone in rachitic foci. Examination of the blood of such patients during treatment by sunshine shows increase in the blood phosphorus, presumably in order to supply the increased amount of bone salts necessary for the new bone formation. Moreover it has long been known that rickets is a disease of winter. The cure of bone tuberculosis is affected, or at least accompanied, by the deposition of new bone in the tuberculous focus. It is customary to judge the progress of cure by following the amount of new bone laid down, as shown in the x-ray. If the bone-forming power of sunshine suggested by these experiments is confirmed, it may well be that herein lies the reason for its greater efficacy in bone tuberculosis as compared with soft tissue tuberculosis.

An attempt has been made to compensate for the absence of sunshine during the winter by using quartz mercury lights. It is somewhat difficult to form an opinion as to their merit. The lamps are expensive, and for this reason the number one can have is limited. This in turn limits the amount of exposure possible to give each patient. During the past winter my patients received 30 minutes' exposure to quartz mercury light each day, as compared with four to six hours' sunshine during the summer. Exposure to this light produces pigmentation of the skin fairly rapidly, but it is of a lesser degree than that produced by sunshine. Its effect upon tuberculous foci is not so striking as that of sunshine. In fact I am doubtful whether it plays any part in hastening the cure of the patient, though this point is still *sub judice*.

Conclusions. 1. Sunshine appears to be a valuable adjunct in the treatment of bone tuberculosis, in that a cure is attained by its aid more quickly and more certainly.

2. In cases of soft tissue tuberculosis it does not appear to have the same beneficial effect.

3. The value of quartz mercury light as a substitute for sunshine is, as yet, not certainly known.

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PUBLIC HEALTH ORGANIZATION*

JAMES ROBERTS, M.D.

Hamilton, Ont.

THE last ten of fifteen years has witnessed a radical change with respect to two important phases of the public health problem at least. In the first place the old obsession, that the sources of man's infections were traceable to his environment, has been displaced by present day beliefs resulting from fuller and more accurate knowledge gained by a combination of laboratory and epidemiological studies. The modern theory of infection finds the source of disease in the individual himself—the excretions and emanations of his body, and the transmission of the virus to his fellow-beings to be by contact, direct or indirect, the well nigh universal route.

Secondly, the perspective of the sanitarian, has undergone a remarkable change and his horizon has tremendously widened. Papers at a conference representative of every health department in Ontario on topics such as "Prenatal Care," "Squint," "More Efficient Care of Mothers," "How to produce a clean and safe milk supply," attest the character and significance of the revolution in our ideas as to what may reasonably be considered within the province of the health official and calculated to absorb his energies. In addition to the control of communicable diseases, supervision of water supplies, sewage, housing, and elimination of nuisances, we do not hesitate to include in the category of public health activities such subjects as infant welfare, school hygiene, public health education, industrial hygiene, dental hygiene and personal hygiene. These and other matters of perhaps lesser but still vital importance are to-day regarded without suspicion of protest as coming legitimately within the purview of the regularly constituted health authorities.

My object in this paper is to suggest in what directions future efforts of our health departments might be profitably exerted, while attempting also to outline very briefly changes in machinery and construction necessary to maintain our position as leaders and directors in the new era, and calculated to secure the best and most permanent results. The present system of administration reflects quite characteristically the rapidity of the evolutionary changes in our ideas with respect to the causation of disease and the method of prevention, and in my opinion leaves much to be desired. How best can it be improved? I believe by an extension and elaboration of our present system of health districts. No one in close touch with matters pertaining to the public health in the Province of Ontario during recent years, will question for a moment that the revision of the public health act of 1912, the amendments thereto, and particularly the division of the Province into approximately equivalent units of population for purposes of greater efficiency of administration, has been productive of encouraging results. Among the changes for the better, it is safe to say that the more direct interest of the district health officer in the work of the local boards has had a stimulating influence on the work of the local officers, and has led to the awakening of a keener interest in health matters in many communities throughout the Province. It has become the exception rather than the rule for outbreaks of infectious disease to assume dangerous proportions before arousing the attention of the local authorities, a fact which, in itself, tends greatly to increase the confidence of the general public in the purpose of a health officer and to create respect for his official position.

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*Read at the meeting of the Ontario Health Officers' Association, Toronto, May 29th, 1922.

Several of the States in the American Union have evolved a plan similar in idea to that devised in Ontario, for the appointment of district officers and their duties are similar in character. The Ohio law of 1919, however, provides that each county and each city of more than 25,000 population must employ for full time service, a health officer, a public health nurse and a clerk whose salaries should be paid from local funds.

In my opinion the general adoption of some such plan would be a step in the right direction and productive of benefits hitherto unrealized in Canada in the field of preventive medicine. I would go further and assert with confidence that some such innovation is an essential prerequisite to any marked progress in securing the advantages in community health and happiness that our scientific knowledge warrants us in aspiring to immediately, and is also unquestionably demanded if our responsibility as health officials is to receive the recognition it deserves.

It is true that in our larger centres of population there has been remarkable progress during recent years in the adoption of scientific methods, particularly in the practical application of laboratory findings to the routine departmental work. In many of these centres we have full time health officers, full time bacteriologists, qualified food inspectors, and a corps of public health nurses: each division working in harmony with the others toward the prevention of preventable disease. Even with such impressive equipment and elaborate machinery supported by annual appropriations by no means of trifling or insignificant proportions, can it be truthfully asserted that we are accomplishing more than merely lopping off the branches, instead of striking at the root of the giant ygdrasil under the protecting shade of which the forces of disease and death threaten continually the welfare and happiness of our people? The exanthematous diseases still kill their thousands, the great white plague its tens of thousands, annually.

Time will not permit even a feeble attempt at an enumeration of the many fields of public health endeavor in which, by reason of insufficient funds and imperfect organization the urban M.O.H. is not permitted to engage, save in a desultory fashion. The adequate housing of our artisan population is in its infancy. Our child welfare work is spasmodic and fragmentary, our school inspection imperfect, while industrial hygiene is as yet not much beyond the stage of experimental research. We have scarcely done more than touch the fringe of the venereal disease problem. In the domain of mental hygiene, while the problems of delinquency, incorrigibility and criminality are receiving some attention, the question of how to increase the stock of the thrifty and capable and to shift from their shoulders the burden of the unenterprising rich and unenterprising poor is still in the novitiate stage.

If this is the state of affairs in our large cities, what shall be said of hygienic advancement in our smaller cities, towns and rural districts? In some of these, particularly in the rural districts, the last decade has witnessed a marked improvement in the sanitation of rural homes, but in many sections signs of progress are still lacking. Respiratory infections arising from neglect of personal hygiene and circulatory disturbances due to exposure and overwork are very prevalent. Small outbreaks of typhoid fever are still a frequent occurrence among our suburban populations, and in our towns and smaller cities our water supply requires the constant supervision of the central authorities to ensure its purity. It is stated by those in close touch with the tuberculosis problem, that this disease is surprisingly prevalent in some of our farming communities. It is only in the last few years, through the bureau of child hygiene of the provincial board of health, that active interest in the care of babies and the promotion of child welfare has been introduced in our towns and smaller cities. No cities of under 20,000 people employ a full time health officer. It is said they can not afford to do so, from lack of funds. In populations of less than 15,000 persons, not to speak of towns, villages and rural municipalities, full time health officers, bacteriologists, milk and dairy inspectors are out of the question, because the expense of maintaining such a staff is prohibitive, and moreover if finances were forthcoming, the amount of work to be done would be insufficient to occupy their undivided attention, with consequent waste of funds, dissatisfaction, criticism and disparagement of public health work.

My contention is that most of our difficulties in providing an adequate service, and a service that would command more universal respect, is due to the fact that our unit of administration is too small. Given a population of from 25,000 to 50,000 persons we have first and most important to provide a full time health officer. To be successful this official must be intelligent and specially educated and trained for his work. The popular misconception that any graduate from a medical school is competent to assume the duties of health officer is responsible for many of our shortcomings in the practice of preventive medicine. The scriptural statement that no man can serve .two masters is exemplified by the attempt of a physician dependent on practice for a living, to discharge satisfactorily the duties of the M.O.H.. If he carries out the duties as a side issue in his daily routine, the importance of the work is discounted in the eyes of the public; if he is faithful and conscientious he makes enemies and injures his reputation. The full time health officer should above all things, be imbued with the idea that his work is a public necessity and a solemn trust. He ought to be held responsible for the public health in a community, using the term in its broadest sense. I think the words "public health" convey a rather hazy and indefinite meaning to the man on the street, and if it were possible to rechristen our health departments as departments of preventive medicine, the prestige of our position would be greatly enhanced.

In a population such as I have mentioned there should be provided a competent health officer with his tenure of office sufficiently secured, and there should be an adequate revenue for the support of a health department organized to meet the special needs of the area it is intended to serve. A commissioner, a board of health, or a governing body of some political sort may be included but is not indispensable. An appointee of the government, answerable to the central authority, as in the case of the district officers, and relying for criticism or reward on a body capable of judging intelligently, has advantages not be be ignored. There should be a well equipped central building or office from which the direction of all the personnel should proceed. Call it a health department, health centre, community centre, or department of preventive medicine, as you please; names are immaterial. Let function be its chief importance and let this function be the prevention of disease. A small but efficient laboratory is essential and cannot be dispensed with.

The place of the voluntary agency in relation to the official health officer I shall not attempt to touch upon. The question has afforded material for very considerable discussion and is still in most communities an unsettled controversy. My personal opinion is that if it were possible to accomplish a consolidation of effort and uniformity of purpose among the voluntary associations, so that the whole problem of disease prevention could be surveyed by them in its entirety and effort not exclusively focussed on special and often narrow fields, the net gain to the cause of public health would be very considerable indeed.

That the health officer should confine himself to the exercise of his powers as a police official, I do not believe for a moment. Like the pilgrim in Bunyan's famous allegory, so long as he is burdened with the weight of this delusion he flounders in the Slough of Despond. The more time he spends on understanding the temperament of his community, and educating them to accept compulsion, the less excuse he finds for the employment of his punitive authority. "To hear people talking about police regulations," says Dr. Hastings in his epigrammatic manner, "is like ministers talking hell fire." Neither do I believe the organization of our work in preventive medicine should proceed halfheartedly along haphazard lines. The salvage of human life transcends in importance all other considerations in the conduct of human affairs. The words of the Chief Health Officer of the province in his review of ten years progress will be a foreword for future generations. "It is the paramount duty of every government to protect the health of its citizens. Prevention of disease is by far the greatest field of modern medicine. It is not only the most economical but the most reasonable, successful and satisfactory plan of procedure in respect to diseases."

OSTEO-ARTHRITIS*

W. A. Gardner, M.D., C.M.

Lecturer in Clinical Orthopædic Surgery, University of Manitoba

THERE are numerous names for this chronic disease of the bones and joints, and all seem to refer to one condition, variously named by different observers, and due in its many pathological manifestations to one cause, namely, bacterial infections and their toxines. That infection is the cause of osteo-arthritis seems pretty well established in the minds of present day writers, and we hear and read little of intestinal stasis or altered metabolism as the primary cause, except in so far as they favor the spread of bacterial infection.

Many papers have appeared recently on the dangers which may arise from focal infection, and much experimental work has been done to demonstrate the association of infected tonsils, infected sinuses, and infected teeth, with osteo-arthritis and its many allied conditions—fibrositis, myositis, neuritis, neuralgia, myalgia, and peri-ostitis. Which one of these tissues is involved in the many indefinite shoulder pains, pains in the back and pains in the extremities, with negative *x*-ray findings and due to focal infection, I for one have no way of determining, and believe that in this I have many fellow sympathizers. Teeth hold first place in the list of septic foci; *x*-rays revealing septic conditions about teeth that are not shown by ordinary examination. Banjamin Rush[1] wrote the following history in 1801: "Some time in the month of October I attended Miss A. C. with a rheumatism in her hip joint, which yielded for a while to the several remedies for that disease. In the month of November it returned with great violence, accompanied with a severe tooth-ache. Suspecting that the rheumatic infection was excited by the pain in her tooth, which was decayed. I directed it to be extracted. The rheumatism immediately left her hip and she recovered in a few days. She has continued ever since, free from it. I have been made happy by discovering that I have only added to the observations of other physicians, in pointing out a connection between the extraction of decayed and diseased teeth, and a cure of general diseases." As the editor observes, except for some difference in style, this might have been written one hundred years later.

Next in importance to teeth, comes the tonsils. British writers are much more cautious than American, in their statements as to the importance of the tonsil. Jones-Llewellyn[2] and Bassett-Jones in their work *Fibrositis* only mentioned tonsillitis as pre-disposing to relapses. Jones-Llewellyn in his *Arthritis Deformans*[3], believes the etiological importance of throat infections in rheumatoid arthritis, is underestimated. Under the head of treatment, he advises that the teeth should be attended to, first, and later, in any case of rheumatoid arthritis in which recurring attacks of tonsillitis have been followed by exacerbations of the joint condition, it would seem justifiable to advocate excision as a prophylactic measure against future attacks. In his recent works, Dr. Llewellyn is insistent on the etiological importance of the tonsil in chronic arthritis, and devotes considerable space in "Gout" to the rôle of the tonsil in providing the source of infection for this condition. The tonsil is suggested definitely in some cases, thus: "The arthritis began after tonsillitis, and each fresh attack gives rise to an exacerbation of the joint pains." In others the tonsil only comes under suspicion because no other focus of infection can be found. That the tonsil can supply the organism that causes arthritis has been proven by animal experiments. The question as to what is a septic tonsil cannot be answered clinically or indeed bacteriologically to judge from recent careful work on tonsil crypts.

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There is a tendency for the disease to come to a standstill in all cases spontaneously, and too much importance cannot be claimed for improvement following at long intervals after the removal of tonsils"[4]. Watson Williams states: "There lies in the nasal accessory sinuses, a possible source of chronic systemic infection, which merits more attention than has hitherto been accorded to this region[5]. A nasal source of infection in osteo-arthritis is liable to escape attention, and the joint affection is more prone to arise in patients whose nasal symptoms are slight, rather than in those where there is profuse nasal rhinitis. The cause of this probably is that, given an infection where there is an outpouring of polymorphinuclear cells with phagocytosis, the invading organisms are so largely inhibited or ingested, that the patient is protected from toxic absorption, whereas in other cases with few pus cells, toxic absorption is more pronounced." Several cases are cited with very slight apparent symptoms, and the accessory sinuses were found infected and drained with gratifying improvement, in osteo-arthritis and articular fibrositis.

In searching for a possible focus, we have probably attached too much importance to the parts easily accessible to examination, and have not paid sufficient attention to the gastro-intestinal tract, and the pelvis, prostate, vesiculæ seminales, tubes, and lymphatic glands; even though Pemberton[6] tells us that Neisser infection in his 400 cases played a nearly negligible rôle in chronic arthritis. McRae[7] thinks there is no evidence to show that metabolism is at fault as an etiological factor, and that such metabolic disturbances are a result and not a cause. Pemberton has shown that there is a lowered sugar tolerance during the active stage of chronic arthritis, which becomes normal when the inflammation subsides.

Trauma, such as fractures in the vicinity of joints or less severe injury to bones and joints, is followed in many cases by osteo-arthritic changes, and is a very definitely determining factor in the development usually of hypertrophic changes, more especially in people of middle age. Exposure to wet and cold in trenches has been followed by various forms of chronic arthritis in our soldiers, some of whom have improved on the removal of demonstrable foci of infection, and as many have shown little or no improvement. "Bacteriological studies show that chronic infectious arthritis is usually caused by strains of streptococci, which are generally non-hæmolytic and of low virulence"[8]. Nichols and Richardson state, the same etiological factor produces in different individuals either the proliferative hypertrophic arthritis, or the degenerative atrophic arthritis, and even in the same individual, one joint may conform to one type, another joint to a second type, with a villous arthritis in a third. There is no reason to suppose these various pathological conditions constitute different diseases, but are the result of varied reactions on the part of the individual to the same etiological factors; infection, toxins, and altered metabolism. In the use of such terms as hypertrophy, proliferation, atrophy, and degeneration, one is apt to become confused, as all conditions may exist in the same joint; hypertrophy of bone, hypertrophy of synovial membrane and atrophy of muscle and bone, with degeneration of cartilage. In one type, hypertrophy of bone in the form of lipping and osteophytes at the articular border predominates. In another type, peri-articular thickening, with bone atrophy, erosion of the cartilage, contraction of muscles and tendons with resulting deformity, even to partial or complete dislocation of the joint, is found. Fibrous or bony ankylosis may or may not occur, and peri-articular tissues, ligaments and tendinous attachments, may be changed into bone, ankylosing the joint completely as in poker spine. It is probably better not to attempt to classify these changes on the above basis, as they are so mixed, it only leads to confusion of ideas when nature refuses to conform her pathology to our classification.

We have all seen splendid results follow the, removal of hypertrophied or diseased tonsils especially in children; but all too often we have had no benefit to our arthritic patients after extraction of teeth, removal of tonsils, and drainage of infected accessory sinuses. So much has attention of late years been focussd on these areas, that the majority of our patients suffering from chronic arthritis, have undergone all this treatment before we see them. Many of their own accord, have had all their teeth extracted good, and doubtful, to get relief. My own experience with antogenous vaccines, foreign proteins, thymus gland, pituitary extract, and the multitude of other recommended remedies, has been of no value that I could determine, but much more useful testimony is that of Dr. Frank Billings from whose paper the following quotaton is taken. "These statistics confirm and substantiate the opinion we have expressed on former occasions, that specific remedies in the form of bacterial antigens are of little or no value in the treatment of chronic infectious arthritis"[9].

The importance of physical therapy cannot be gainsaid, and undoubtedly tends to improve the health of many of these patients, and promotes better circulation in the affected parts, besides having a good psychical effect. The great variety of physiotherapeutic methods, high frequency, hot and cold baths, hot air, baking, and massage, ionization, sprays, etc., all seem to act in one and the same way; that is, to produce hyperemia, and to me, it is doubtful if any one of them has any other action than this. The choice of these is baking and massage, with regulated exercise, and in very chronic conditions manipulation is followed by benefit.

It is much easier to offer destructive criticism than to present something constructive and of real benefit, but physiotherapy has also to its credit, that patients under treatment by it, are not clamoring for drugs and medicines to drink, most of which are without benefit, and many of them injurious. From a strictly orthopedic standpoint, there are two duties; first and foremost, to prevent deformity, and second to correct deformity. All deformity in rheumatoid arthritis, according to Prof. Allan Todd[10], can be prevented, yet many patients, when they have recovered from their disease, are so crippled and deformed they are bed ridden. Deformity is caused by muscular spasm, faulty position, and finally by anatomical changes. Flexor muscles are stronger than extensors, and recovery takes place with limbs flexed. Soft tissues contract when limbs are long held in a flexed position, and the contracted joint capsule becomes adherent to structures inside the joint. The feet should be supported at a right angle; flexion of knees and hips prevented by splinting, wrists kept dorsiflexed; elbows maintained in best position of ankylosis occurs, and pronation of forearm avoided. In manipulative correction of flexion deformity, care must be exercised to avoid injury to shortened vessels and nerves, and extensive degrees of flexion reduced in two or more stages.

One must choose carefully the time to manipulate deformed joints to avoid lighting up a latent infection. It requires careful judgment in deciding which cases to operate on, when to operate, and when to be satisfied with manipulation. Excision of the hip joint is an operation that so frequently gives poor results, it is only advisable in patients with a great deal of pain and bone destruction; after operation, such patients are a long time attaining any degree of usefulness in their limbs. So many moderately deformed joints recover with useful hips on the whole, even more so than cases after excision, that conservative treatment must be given a long trial before rushing into surgical interference in the hip joint.

Excision of the knee is a good operation, in cases of extensive bone destruction, in bony ankylosis in a flexed position, or in joints with restricted and painful movement.

Of arthroplasty in knees and hips, I have small experience, but it is an operation that seems to have grown in popularity very slowly.

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Retrospect

THE ETIOLOGY OF SOME FORMS OF MARASMUS IN INFANCY, ITS TREATMENT BY LACTIC ACID WHOLE MILK.

The marantic infant has for many decades been a subject of earnest thought and careful research. The etiology strikes deeply at important factors in an infant's nutrition but at which of them has long been a matter of doubt. Congenital anomalies in structure, acute and chronic infections, unsuitable food and unhygienic surroundings have all an important influence on an infant's nutrition and one and all may play a part in the etiology of marasmus or athrepsia; in its treatment all must receive individual consideration. Nevertheless up to the present we have been to a great extent in the dark as to the exact part each of these several factors play in its causation, and why these marantic infants die. No important information has been obtained from the autopsy room. As a consequence much investigation has been undertaken and much speculation has been indulged in. In one group of cases Finklestein has emphasized the conception of "food poisoning" as the important factor and has relegated infections and constitutional abnormalities to the position of mere contributing factors, exerting their influence chiefly in lowering the infant's power of digesting food. The fact that many of the symptoms were aggravated when an attempt was made to give certain elements of food in increased amounts was the original basis for this belief. Careful investigation and experimentation, however, failed to reveal any substance or substances which produced symptoms similar to those met with in acute cases of so-called "food poisoning."

Two types of marantic infants may be recognized. In one acute in character we meet with a rapid loss in weight, cold extremities, small pulse, and scanty urine. The respiration in severe cases is deep and rapid resembling that of "air hunger," and the rectal temperature is high. The resemblance of some of the symptoms to those met with in acid-poisoned animals directed attention to the condition of the blood, and the possible presence of some abnormal acids in its serum; and in 1916 Howland and Marriott demonstrated that an actual acidosis was present; an acidosis not due to any over production of acetone bodies but to the failure of the kidney to excrete acid phosphate. This failure in the kidney secretion was shown to be in great measure due to an anhydraemia arising from an excessive loss of water from the body, a loss occurring in chief amount most frequently from the bowels. As a sequence of the loss of circulating fluid we meet with a compensatory constriction of the arterioles; in many cases, however, this constriction is inadequate and a considerable fall in blood pressure occurs. Marriott has also shown by means of Stewart's calorimetric method that while in normal infants the volume flow of blood through the arms is from 15 to 22 c.c. per 100 gms. of body per minute, in these acutely anhydraemic infants, the flow is greatly diminished; in some instances as low as 2 to 3 c.c. per minute. On this Marriott remarks that if the blood flow through the abdominal vessels is diminished to any such degree as it is in the extremities the functional ability of the intestinal tract to care for food must be greatly diminished. Straub, quoted by Marriott has shown that dogs rendered anhydraemic by a diminished intake of water are very apt to develop diarrhoea and vomiting when fed even on simple food. In these anhydraemic infants Woodyatt and his collaborators have also shown that the action of sugar and salt in the food is to favor the removal of still more water from the body by kidney or bowel and to lessen the amount of fluid available for the reduction of temperature by evaporation. Water evaporation is of even greater importance in the regulation of body heat in an infant than in an adult, but Marriott adds, that although the increased temperature of anhydraemic infants may frequently be explained by an insufficiency of water, infection cannot always be excluded, and in some cases the fever of infection may be attributed in part to an insufficiency of water.

A second type of marantic infant may develop a somewhat similar condition of anahydraemia in a slow, insidious way. An artificially fed infant shows signs of faulty digestion; it begins to vomit occasionally; the stools vary between constipation and diarrhoea; the body weight fluctuates and then declines. In this condition some parenteral infection sets in, such as a bronchitis or a pneumonia, and under the further impairment of the gastro-intestinal function produced by the infection diarrhoea develops and the weight declines progressively. Infants fed on very dilute milk or on insufficient amounts of proprietary foods never do well. The infant ceases to thrive and wastes to a mere skin-covered skeleton. From the metabolic standpoint the most outstanding features of the condition are an inability to utilize food and a negative nitrogen and mineral salt balance. No anatomical basis for the symptoms of this condition has been found, and the fact that some of the symptoms of the two conditions are identical, and that one often merges into the other, points to a common underlying factor in both.

On an investigation of the protein content of the blood serum of these infants by Marriott and Perkins it was found that the percentage of protein was usually lower than the average for infants of the same age. There was also a diminution of the red blood cells and of the haemoglobin. Further investigation showed that these infants had a lower blood volume, both absolutely and in relation to their wasted body weight, a fact which indicated that a considerable destruction of blood must have occurred along with the wasting or breaking down of other parts of the body. As a result of the decrease in blood volume, the volume of the flow is also diminished, often to less than one-fifth; occasionally to less than one-tenth of the normal. An additional factor leading to the poor circulation is the poorly nourished condition of the heart muscle. It is easy to understand why an infant with a blood volume already diminished by atrophy, should, when that volume is still further diminished readily develop the toxic symptoms characteristic of anhydraemia.

In uncomplicated cases of this chronic marantic condition, there is no increase in the concentration of body fluids, and no bar to free evaporation of water, fever consequently does not occur. There is no increase in the colloidal osmotic pressure of the blood, hence no diminution in the amount of urine secreted, and no accumulation of urinary waste products in the body.

Marriott attributes the cause of this condition to an insufficient intake of food; due to prolonged underfeeding, or to the administration of a food which is either incompletely digested or incompletely utilized by the body tissues after absorption. In this condition of athrepsia, as in that of anhydraemia the indication for treatment are clear but often difficult of fulfilment. We have in the one a lack of nourishment and in the other a lack of water. When these two conditions can be supplied and retained, recovery is possible.

LACTIC ACID MILK FEEDING IN MARASMUS

R. R. Struthers, M.D.

Montreal.

The basic idea in the feeding of lactic acid milk mixtures to marantic infants is to offer the child in a readily assimilable form, sufficient calories to meet not only the basic metabolic needs and the growth factor of a child of marantic weight, but to meet also the caloric needs of a child of the proper weight for the age. The marantic infant needs almost as much food as the normal infant of the same age and much more food when calculated on the basis of his actual weight. On account of the lowered powers of digestion and assimilation it is often impossible to administer such an amount of food in the form of the usual milk mixtures. In whole lactic acid milk mixtures we have a food of high caloric value which is readily assimilated by these infants.

Marriott[1] in his discussion of the pathology of marasmus concludes that partial starvation is the real condition present. Many of the digestive upsets in infants are accompanied by the loss of body fluids by diarrhoea; that is a temporary desiccation of the blood tissue. The degree of this desiccation can be estimated by refractometric methods which determine the percentage of the proteins in the blood. A drop of the patient's serum is examined through a refractometer and the index of refraction is correlated with a given scale.[2] Utheim has shown[3] that the average protein content, estimated by this method, of the blood of the new born is about 6.25 per cent; and the percentage rises gradually to 7 at the age of one year and to about 8 per cent., at two years. During a period of desiccation or anhydraemia, this same method shows that the blood proteins[1] owing to loss of water by the body may be concentrated to 8, 8.5, or even 9 per cent. in a very young infant.[4]. If sufficient fluid in the form of intraperitoneal salines or intravenous salines and glucose is not administered to bring the blood proteins back to their normal percentage (that is to bring the blood volume back to approximately normal) this excess of protein is destroyed;[3] not only is the excess destroyed but the percentage of protein drops below normal, to even 4.5 per cent. and with this destruction the clinical condition which we call marasmus develops. As an end result we have a blood stream not only smaller in volume but also poorer in quality. This blood deficiency can sometimes be replaced by a transfusion of blood from a suitable donor, thereby giving the patient not only increased blood volume but also approximately the correct blood constituents. This may eventuate in rapid recovery; but unless the underlying cause is removed the condition may progress to a fatal marasmus. Utheim has also shown, by experiments on rabbits, that the normal blood volume must be restored before any improvement in the condition of marasmus can take place. Following the termination of the period of partial starvation which produced the condition, there is generally a long "period of repair," during which the blood volume is being built up, and before any notable or steady gain in weight can occur. This means that the digestive tissues and the secretory glands must be nourished by a blood stream of normal contents before they become able to do the work demanded in the digestion of a food of sufficient caloric value to supply the body needs. If the child is fed a sweet milk mixture of what is ordinarily considered the proper dilution for its age, its gastric mucous membrane is unable to secrete sufficient hydrochloric acid to produce the optimum hydrogen ion concentration for the action of the gastric enzyne rennet to be complete; the pyloric stimulation which is brought on by the acid gastric juice, is faulty; "secretin"[5] the hormone which stimulates biliary and pancreatic activity is not formed, and incompletely metabolized food is left in the digestive tract to become a potent agent for further acute digestive upsets. As a consequence, there is poor assimilation of the food offered, and the infant gradually wastes away, living to some extent on its own tissues. The clinical appearance of such a child is unfortunately much too common to require any description here.

From the above statement of the pathology of the condition, it would appear that the important indication in treatment is to procure a food more readily assimilated than the ordinary dilutions of cow's milk. It is to be noted that cow's milk has a much higher "buffer" value than human breast milk; that is to say, more acid or alkali is required to change the chemical reaction of cow's milk than is required for breast milk; hence the gastric cells of the infant fed on cow's milk have to secrete more acid to bring about the optimum hydrogen ion concentration for perfect rennet action, than do the gastric cells of a breast fed baby. By actual experimentation with the two milks we find it requires about three times as much acid to produce this optimum in cow's milk as in breast milk, and the secretion of this increased amount of acid is beyond the powers of the marantic child. The feeding of breast milk would, therefore, appear to be the rational treatment, but unfortunately breast milk is seldom obtainable and is sometimes of questionable origin. Some form of cow's milk mixture becomes then the necessary substitute.

As Marriott says[1] "It is interesting to note that those foods which have been found, empirically, to be the best tolerated by athreptic infants are those which have a lower buffer value or those in which the buffer is already partly neutralized by acid. Breast milk, well diluted cow's milk with added carbohydrate, lactic acid milk and protein milk are examples."

The difficulties in obtaining good breast milk have already been mentioned. It is impossible to give the required calories in a food mixture made from protein milk even with the addition of a considerable percentage of carbohydrates. The difficulty in the use of sweet cow's milk mixtures has been stated. Lactic acid milk is a milk which has been previously sterilized by boiling or pasteurising, and which is then inoculated with a culture of lactic acid bacillus and allowed to stand at room temperature for twelve to twenty-four hours with the production of lactic acid at the expense of the carbohydrate in the milk. It is a whole undiluted cow's milk in which the higher buffer value has been neutralized by the production of an organic acid. In its use the infant's gastric mucous membrane is called on to produce less acid to secure the optimum hydrogen ion concentration than in the use of other milk mixtures. Hence the milk may be administrated in a more concentrated form, and each ounce of the food mixture will have a higher caloric value. Experience had shown that undiluted lactic acid whole milk may be fed babies (not marantic) at the age of two months with no untoward results.

In the feeding of malnourished and marantic children Marriott finds[6] that the proper basis for the estimation of the caloric requirements of a marantic patient, is the estimated normal average weight for the age, rather than the actual weight. The difference in the weight of a marantic and of a normal baby of the same age, lies chiefly in the amount of fat, metabolically a relatively inert part of the organism, with which the child is clothed. A normal child of four months should weigh approximately eleven pounds, therefore would require some five hundred to five hundred and fifty calories per day, whereas the marantic infant may weigh only six or seven pounds, and if fed according to its actual weight at fifty calories to the pound, would receive only from three hundred to three hundred and fifty calories per day. To gain rapidly and steadily in weight he requires the same five hundred to five hundred and fifty calories per day as the normal infant. To give the necessary additional calories food in a concentrated form must be given, to keep the volume of the daily feedings within the capacity of the infant's stomach. Here lies the real value of lactic acid milk; it can be fed undiluted to even young infants whose digestive powers are much below par, thereby giving the infant the necessary calories for growth and gain in weight. Ordinary sugars can be used in combination with lactic acid milk as in any sweet milk mixture, thereby increasing still further its nutritive value. Even higher percentages of carbohydrate than are usual may be employed, especially if containing a large proportion of a dextrin fermentable with difficulty such as dextri-maltose or commercial corn syrup.

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Study of Exophthalmic Goitre and the Involuntary Nervous System.—Leo Kessel, C. C. Lieb and H. T. Hyman, New York, define exophthalmic goitre as (1) a clinical collection of sympathomimetic symptoms (tachycardia, tremor, exophthalmos, sweating, asthenia, polyrrhea [diarrhea], etc.), associated with (2) metabolic upset (elevated basal metabolism), and usually accompanied by (3) hyperplasia of the thyroid gland. No one of these three components is pathognomonic. Elevations of basal metabolism may occur in other conditions dissociated from goitre or alterations in the involuntary nervous system. Hyperplasia may also occur dissociated from alterations in the involuntary nervous system or elevation of the basal metabolism. Sympathomimetic manifestations may be present with or without hyperplasia of the thyroid gland and with a normal basal metabolism. It is to the last group of symptoms that the authors apply the term "autonomic imbalance." This syndrome differs from exophthalmic goitre only in that the basal metabolism remains normal. Patients with active exophthalmic goitre usually give a history of autonomic imbalance, and those with arrested exophthalmic goitre differ only in presenting a history of crisis. The transition from autonomic imbalance to exophthalmic goitre, occurred in a patient under observation. This led the authors to believe that disturbance of the involuntary nervous system plays an important rôle in the causation of exophthalmic goiter. The fact that stimulation of the involuntary nervous system by epinephrin produces an elevation of the basal metabolism and that this increase is independent of the thyroid gland suggested a more complete study of the involuntary nervous system, especially the thoracolumbar division. Since it is admitted that epinephrin acts only on the myoneural junctions of the thoracolumbar division, the sensitiveness of these patients to the subcutaneous injection of epinephrin localizes the abnormality in the myoneural junctions.—*Jour. Am. Med. Assoc.*, Oct. 7, 1922.

Editorial

THE MODERN CONCEPTION OF MENTAL DISEASE

IN several addresses delivered recently in Canada, Dr. Macfie Campbell, of Boston, has called the attention of the profession to the importance of recognizing mental disease in all its forms, and taking steps for its proper treatment. We regret that lack of space prevented us from publishing in full his address before the Ontario Medical Association, but we think it desirable to lay before our readers many of the important thoughts it contains.

An organized warfare against mental disorders as well as against tuberculosis and venereal disease is demanded on behalf of the social and economic well-being of the community and is one of the important tasks of modern medicine. To indicate the extent of the problem, it may be sufficient to state that in the United States there are more beds for patients in hospitals for the insane than there are for patients in all other hospitals for general or special diseases, including state, municipal and private hospitals. In the fight against disease co-operation is essential. There must be intensive research by the medical man in the sick room and in the laboratory. The known facts of disease must be made available to the community and there must be sufficient appreciation of their value by the public to translate into working machinery the reasoned conclusions of medical science. Without such co-operation, progress is bound to be halting.

The term "mental" in spite of its frequent employment is seldom perfectly understood. It is a term coloured with emotions, and is apt to bring with it unpleasant mediæval associations. By the general public it is deemed respectable to have an attack of nervous prostration or so-called neurasthenia, but if the term "mental disorder" is used it may handicap a career. As a matter of fact, so-called neurasthenia is seldom a disorder of the nerves; it is a disorder of the personality often involving the emotional life of the individual, and may, therefore, be of mental origin. It is a term, however, which has more of a social meaning than accurate medical significance. No person of any importance, even though he should commit suicide, is supposed to have had melancholia, which would be a mental disorder; he is said to have suffered from nervous prostration, frequently attributed to overwork, probably, the rarest cause of disease. The use of the term "mental disorder" is apt even by the profession to be limited to disorders where the symptoms are definitely mental, where the patient is dominated by abnormal moods and attitudes, such as depression, suspicion or doubt, or by false perceptions or beliefs, such as hearing imaginary voices, seeing visions or believing in impossible forms of influence; or where the patient's behaviour is dominated by obscure impulses and cannot be explained along the line of ordinary motivation. These are disorders which even the laity recognize as mental disorders, and are spoken of and referred to as "insanity", which, however, is a legal and not a medical term. There are many other mental disorders, however, which are never thought of as such, and which are not treated as such, because the symptoms are the familiar symptoms of the simple organic disorders. They are mental disorders, however, when their roots lie, not in the disorder of any simple organ or system, as in a nephritis or anæmia, but in the instinctive and emotional life of the individual reacting to the tests of life. A headache is a mental disorder when it is due not to some simple disorder of refraction or to a toxic condition, but to an unwillingness to meet some social situation, deliver a lecture or digest a snub. Sleeplessness is a mental disorder when it is based on emotional tension and irritating memories or hidden fears. The key to many cases of sickness is not found because too often no attention is paid to the rôle of emotional, personal, or mental factors. The physician who has not systematically studied the complexity of human nature with its complicated instincts and emotions and personal factors, who does not realize the influence on the adult of the experiences of adolescence, puberty and childhood, who does not know that emotional reactions and modes of thought in the adult often hark back to the reactions of the child and of our primitive ancestors, takes a certain risk when he discards such facts of the past as irrelevant and assumes that the problem before him is always a definite laboratory disease. One has to realize that man, when thwarted and discouraged in grappling with the real difficulties of life, has a capacity for constructing a world of his own, a world which has great value to the individual and the group, and which under circumstances may become to the individual more real than the objective world in which he moves and has his being.

The mental balance of the individual may be disturbed in other ways than through thyroid disfunction or neurosyphilis or other similar cause of toxic origin. In human adaptation to external situations and to internal conflicts, there is a constant conflict between the higher and the lower, the more recent and the more primitive, between the ethical and the cosmic, between clear objective grasp and consistent purpose on the one hand, and subjective fantasies and blind instinctive strivings on the other. The equilibrium may be disturbed because the higher functions are unequal to the continuous strain or because the blind strivings of the lower functions have become more insistent, either stimulated from within or without, or because a life situation looms up which is beyond the ability of the individual to deal with. The study must include the congenital endowment of the individual, the way in which the experiences of early life have modified later behaviour and character, the special mode in which the individual has tried to compensate for elements of weakness and to strike a balance between conflicting forces. Studies of this nature strip mental troubles of their mystery and obscurity and reduce them to fascinating problems in psychology, which is the most complex branch of the biological sciences. Early touch with the personal difficulties of the child, the organization of a frank and wholesome atmosphere in which all problems can be brought to the surface and frankly discussed, encouragement to face one's limitations in an honest way, and careful study and treatment at the earliest indication of any break in adaptation may bring about striking changes in the mental health of the community.

THE PHYSICAL EDUCATION OF GIRLS

A COMMITTEE was formed in England last year, under the chairmanship of Dr. George F. Still, to consider the advantages or otherwise of physical exercises for girls. On the committee were representatives of the several Royal Colleges, of the British Medical Association and of all the important women's associations interested in the training and development of girls. At the outset the Committee thought it desirable to obtain the views of those who might be expected to have special knowledge of the subject and a series of questions were issued to all such. Altogether 629 replies were received, and these were submitted to a sub-committee consisting of the medical members of the Committee. Their first report has been recently issued. From it we learn that the medical committee consider that a suitable physical education including games and sports is as beneficial for girls as for boys, but advises that before the more strenuous forms of exercise are undertaken a medical examination should be passed. Discrimination is necessary. Individual girls may be unfit for particular forms of exercise. Competition games are permissible provided they are undertaken after medical examination. Any game or sport may become unsuitable if practised in such a way or in such a degree as to cause undue strain or fatigue. The games that met with most general approval as suitable for girls were tennis, netball, hockey, cricket and swimming. The value of dancing was generally recognized and a majority were in favour of riding, fencing and golf. Foot-ball was disapproved of as being altogether too strenuous.

The use of apparatus demanded supervision as the committee considered that injudicious exercises on some forms may produce injury. Of the value of disciplined exercises, however, under expert direction there was little difference of opinion. By all they were thought to promote the harmonious development of the muscles, and to prevent faulty position and carriage. There was also a general consensus of opinion that the effects of games and physical exercise on the disposition and on the character generally were beneficial. Apart from physical fitness it was considered that they conduce to alertness, resourcefulness and judgment, and encourage a public spirited and healthy outlook. A few, however, thought that in some instances sports tended to foster a love of pleasure detrimental to home and that they were detrimental to the finer womanly qualities.

Physical fatigue unfits for strenuous mental work. A girl who is working at high pressure for examinations should play games less strenuously. Abstention from strenuous games and sports during the menstrual period has been generally recommended but evidence has been brought forward recently to show that complete restriction at this time may be harmful rather than beneficial. The medical members of the committee stated that while they were not prepared to make a final expression of opinion on this point, they considered the evidence so far as in favour of an extensive trial of the voluntary continuance of games, sports and gymnastics at this period. The possibility of any internal displacement they regarded as slight. An important point considered in connection with much strenuous exercise for girls was its influence in after life upon motherhood. Increased muscular exercise if severe and prolonged may increase bony growth and with it the difficulties of parturition, but the increase of muscular power would certainly facilitate labour. The report states that there is no clear proof that strenuous physical exercise has any special influence either upon the prospect or upon the difficulty of labour.

THE INFLUENCE OF THE VARIOUS COLOURS ON THE MIND AND EMOTIONS

A SERIES of charts have been published in Germany to teach by the object method what has been ascertained regarding the influence the various colours exert on the mind, and especially the emotions, and through them on health. White makes a room look larger and lighter, but the effect on an occupant is one of coldness and emptiness. Crimson is stimulating. Children in a room with crimson tinted walls, or in light passing through crimson shades are said to work with increased energy. Yellow gives a feeling of sun-warmth and a sense of comfort. Dingy rooms are enlivened and made more cheerful by yellow wall paper. Orange exerts the most warmth giving effect, and disposes to cheerfulness. Orange coloured curtains in a bedroom are claimed to have a stimulating influence on the nerves. A pure neutral red may irritate; persons inclined to melancholy may be put into a livelier frame of mind, in a room thus tinted but persons who are nervous should avoid red. Blue has a calming influence and so has green. Patients, it is claimed will sleep better with a night lamp covered with a blue shade, than they will in the dark. Gray if it covers a wide area is barren-looking and dreary. Many patients may be thrown into an unhappy frame of mind by dark and sombre surroundings. These statements may not be equally true for all individuals but they deserve attention in the furnishing of bedrooms and hospital wards.

Editorial Comments

THE SEMON LECTURE AT THE UNIVERSITY OF LONDON.

It is seldom that Canada has been so honoured as it has been this year when two of its University professors delivered notable addresses in England. Prof. H. S. Birkett gave the fourth Semon lecture before the Royal Society of Medicine in London, and Prof. R. F. Ruttan read the Presidential Address before the Society of Chemical Industry. We purpose next month calling attention to some facts of interest to the profession brought out in Prof. Ruttan's address. In this number we publish on another page an abstract of Prof. Birkett's very interesting address on "The Trans-Atlantic Development of Rhino-Laryngology" in which he details the story of the notable achievements of the profession in America in this new field and emphasizes the value of their work in connection with the practical use of the laryngoscope and bronchoscope, adding thus greatly not only to our powers of diagnosis, but also to the efficiency of our treatment.

Is Parentage Determinable by Blood Tests?—The fact that the grouping of persons by isoagglutination– now become generally known since its importance in blood transfusion was stated appears to be hereditary in nature has led Ottenberg to advocate its use as a means of determining parentage. Without attempting to enter into details, the main point in Ottenberg's conclusion from studying 603 persons in 139 families is that if a child's blood group is in harmony with the blood grouping of the alleged parents, it may be their child; on the contrary, if the child's blood does not group itself in harmony with the parental groupings, it must have a parent other than one of those claimed. We see that, at best, the methods obviously would have marked limitations in practice, and that its results in a given case would fall far short of direct identification of any individual as the parent. Buchanan regards Ottenberg's criteria as unsafe, even if the grouping could be carried back for three generations, because of the possibility that the heterozygous status of a parent might result in the appearance in the offspring of an unexpected, yet legitimate, blood group. Evidently the last word has not been said as to the reliability of Ottenberg's method; and further observations will be necessary to bring it out of the realm of controversy. The conclusion is that at present science knows of no blood test by which parentage can be determined.—*Jour. Am. Med. Assoc.*, Oct. 7, 1922.

Men and Books

ON THE TRANS-ATLANTIC DEVELOPMENT OF RHINOLARYNGOLOGY
THE SEMON LECTURE*

THE first knowledge of the nature and use of the laryngoscope was communicated to the profession in America by Hugo Stangenwald in an address before the New York Medico-Chirurgical College on June 14th, 1860. Prof. Jacobi, however, claims in his History of Pædiatrics in New York that in 1856 he had had a small mirror made with which he examined the larynx of one of his patients, but acknowledges that at the time he did not realize the importance of his discovery. Dating from Stangenwald's address, many papers on this subject began to appear in the medical press, perhaps one of the most important being Czermak's essay on "The Practical Uses of the Laryngoscope," which was translated and appeared in the American Medical Monthly, November, 1862.

Although the practical uses of the laryngoscope at this period were regarded by the general profession with some scepticism, its possibilities were foreseen by Horace Green afterwards spoken of as the Father of Laryngology, who recognized the many advantages to be obtained by the use of the mirror, and at an early period predicted that if this instrument could be brought into general use he was confident that the profession would be able to cure diseases now frequently overlooked. Horace Green was one of the first to devote himself exclusively to diseases of the respiratory tract. Associated with him must be mentioned the name of Louis Elsberg, whom Cohen a few years later described as the most accomplished laryngologist in America. Elsberg's attention had been attracted to this subject by a letter from Czermak accompanying a copy of his book. During the next few years Green and Elsberg both contributed many papers to the medical press, and both devised many useful laryngological instruments.

Attention had been attracted to enlarged and diseased tonsils many years before the introduction of the laryngoscope. Philip Syng Physick introduced the first tonsillotome in 1828, but in 1832 Fahnestoch of Pennsylvania introduced the instrument that many of the older physicians will remember; a tonsillotome shaped on the ring knife principle with a needle for drawing the tonsil out of its bed. Much early than this in the later half of the 16th, and at intervals through the 17th century many quaint writings had appeared descriptive of severe and often fatal throat affections evidently referring to attacks of quinsy and epidemics of diphtheria. One of the best of these writings was published by Samuel Bard in 1771 entitled "An Enquiry into the Nature, Cause and Cure of Angina Suffocativa or Sore Throat Distemper" in which he gives a careful and graphic description of what we now recognize as diphtheria involving the mucous membrane of throat and larynx.

The earliest text book of special laryngological interest was the work produced by Samuel D. Gross entitled "A practical Treatise on Foreign Bodies in the Air Passages" published by Blanchard and Lea, Philadelphia, 1854. In 1864 Elsberg published a little monograph on "Laryngeal Medication." This was the first transatlantic work describing the use of the laryngological mirror. The year following was published by the same writer an essay "On the Surgical Treatment of Morbid Growths within the Larynx" which won the prize presented by the American Medical Association. Is this classical work Elsberg shows how quickly he realized and took advantage of the possibilities of the laryngoscope not only as a means of examining and operating upon the hitherto hidden larynx, but as affording an easy and practical method for obtaining fresh pathological tissues for study. Fourteen years later the results of his further studies appeared in an article entitled "Microscopical Study of Papillomata of the Larynx." We cannot to-day accept all his findings as true, yet they show us what manner of student he was. Though a practitioner he was not afraid to attack so obscure and complicated a subject as the histogenesis of tumors.

The first complete treatise on diseases of the throat published either in the United States or abroad was that published by Solis Cohen in

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*Delivered by Prof. H. S. Birkett, C. B., before the University of London, July 12th, 1922.

1872. An excellent work showing not only close intelligent observation of cases in an almost unlimited clinical field, but an exhaustive acquaintance with all modern literature on the subject. Other writers soon followed, and American literature in laryngology assumed much prominence and importance.

Special laryngological societies were first formed in America. The first one was the New York Laryngological Society founded in October, 1873, but which did not last long. The American Larynological Association was founded in 1878; its first official meeting was held in the city of New York in June, 1879 under the presidency of Louis Elsberg.

Two years previously the first operation for total removal of the larynx for a malignant growth had been performed in New York by Solis Cohen. A very notable advance in laryngology was made in 1885 when Joseph O'Dwyer without any knowledge of the unsuccessful efforts of Bouchut presented instruments for intubation to the profession. His stimulus had been the fact that from the foundation of the New York Foundling Hospital in 1869 to the inception of his experiments in 1880 not a single case of tracheotomy for diphtheritic croup had recovered. His labors five years later culminated in the production of an intubation tube which has stood the test of time in overcoming not only the acute, but also the chronic forms of stenosis of the larynx and thus saved thousands of lives. Had O'Dwyer lived he probably would have originated the idea of bronchoscopy. He had already recognized the inevitable disaster produced in a bronchus by a foreign body unremoved, and had constructed a special tube for effecting its removal. Fletcher Ingals was the first surgeon, however, to remove a foreign body in this way in 1904, but to Chevalier Jackson must fall the chief credit for perfecting the means and the method at present in use for effecting this valuable surgical accomplishment.

When speaking of the development of rhinology in America, Professor Birkett credits George Catlin, the well-known explorer among the tribes of North American Indians, as one of the first observers to notice the disastrous effects of mouth breathing. The observations as given in his book published in 1861 are as follows: ‘‘When I have seen a poor Indian woman in the wilderness pressing the lips of her infant together as it falls asleep in its cradle and afterwards looked into the Indian multitude for the results of this practice, I have said to myself, ‘Such a mother deserves to be the nurse of emperors.’’ In a later paragraph he drew attention to the injurious effects of mouth breathing in producing nasal polypi, quinsy, asthma, diseases of the lungs, and irregularities of the teeth.

The study of the diseases of the nose which up to 1874 had been given scant attention received a great impulse from the work of the American surgeons Morris Asch, J. N. MacKenzie, Clinton Wagner and Lefferts, whose efforts were first directed chiefly to securing a free passage of air through the nasal passages. The nasal spray had been introduced in 1866 by Solis Cohen; in the seventies efforts were made to effect the diminution in size or removal of hypertrophied turbinated bodies by the application of astringents, by introduction of sponge tents, and afterwards by the galvano-cautery or snare. In 1878 Solis Cohen attempted the removal of bony obstructions by means of the dental engine and nasal drills. In 1882 Fletcher Ingals performed the operation of resection of deviations of the septum, first reflecting the mucous membrane, then removing the deviated portion of the septum, and afterwards replacing the flap of mucous membrane; a great improvement on the crushing methods previously in use.

The importance of acute and chronic affections of the nasal sinuses was not appreciated in the earlier years of rhinology. It was W. H. Daly of New York who in 1883 directed attention to their importance. Not until 1893 were the operative measures for the relief of these affections placed on a definite base by G. W. Caldwell of New York and almost at the same time by Luc of Paris.

About this date also a knowledge of the value in nasal and laryngological operations of cocaine and its derivatives as local anaesthetics, and of epinephrin as a haemostatic was made known to the profession by F. H. Bosworth and by W. H. Bates of New York, both American surgeons, who in this also led the way.

In closing his address, Prof. Birkett called attention to the great strides which had taken place in this specialty during the past sixty years and in which the profession in America had taken a very prominent part.

Therapeutical and Pharmaceutical Items

SPECIFIC PROTEIN THERAPY

The practitioner must recognize clearly the difference between specific and non-specific protein therapy. In the case of specific therapy, a definite substance is by experiment or test recognized as the cause of the disorder. In non-specific therapy there is no such relation. For example, proteins of the pollen of ragweed cause asthma in certain individuals but not in others in whom some entirely different protein may be responsible. It has long been known that the injection of any protein not normally occurring in the body sets up various protective reactions. Let us take a conspicuous case. If a guinea pig be injected with egg albumin and if, after an interval, it be given a very small dose of the same material (much less than a grain suffices) the guinea pig dies with marked symptoms of respiratory distress. This distress is due to an attack of asthma produced by a contraction of the bronchial muscles. But not only these muscles but all smooth muscle, for example the uterus, tends to be hyperactive. This symptom-complex, the result of sensitization of the cells of the body, we know as anaphylactic shock. By giving very minute doses of the protein repeatedly this sensitization can be reduced or caused to disappear.

It is on this basis that specific protein therapy is undertaken for hay-fever and certain other diseases. But it is found practically that the desensitization or immunity does not last long and it is further possible that all organs are not equally desensitized. Hence the importance of the recent attempt by MacKenzie[1] and Caulfeild[2] to produce not only a general desensitization but also a local one of eyes and nose by the use of dilute solutions of the active protein in water (MacKenzie) or ointment (Caulfeild.)

Reference to the papers noted below, which are but random samples from the literature, will show that in hay fever and certain other types of asthma specific protein therapy carefully and scientifically carried out does yield results. Further study of the phenomena involved both in the laboratory and in the clinic is necessary before the procedure can become a simple and standardized one.

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V. E. Henderson.

NON-SPECIFIC PROTEIN THERAPY

In recent years a considerable number of articles have appeared on the result of treating, by intravenous or intramuscular injection, a great variety of diseases with solutions of various proteins. As a rule these papers report most astonishing improvement, if not cure, and each time one is led to assume a new and important aid in therapeutics has been discovered. A more critical review of the literature shows that the methods described have failed to gain the approval of others, and have not stood the test of further application; the original results have not been confirmed. Reports of these failures have not as a rule appeared in print.

A hurried survey of the current medical journals gives the following comprehensive list of diseases in which this treatment has been reported as successful:—Asthma, hay fever, arthritis, rheumatism, epilepsy, typhoid fever, pneumonia, neuro-retinitis, toxic iritis, septicaemia, intestinal hemorrhage, etc. Many of these diseases run a varied clinical course, and any physician of experience must have witnessed spontaneous cures, arrests or unusually rapid terminations without treatment, or under a type of treatment which fails to effect the same clinical benefit in other cases apparently identical.

The sources of the "protein" used are almost greater in number than the diseases treated and include different commercial peptones, milk, proteose, albumose, egg white, plant proteins, B. Coli, B. friedlander, diphtheria-toxin, cultures made from the intestinal flora, etc.

In carefully controlled experimental work[1] the absolute lack of positive results, which would suggest a value in protein injections, is the rule. So marked was this with regard to at least two experimental infections that Kross[2] states "the recognized clinical dangers of the procedure (including even death) would indicate the need for caution in assuming the therapeutic value of intravenous injections in the treatment of infections."

This is the indefinite situation in which the profession finds itself with regard to the possible use of protein solutions. This indefinite situation is also the explanation why so many commercial concerns are circularizing us with their pamphlets and reports, on the use of "non-specific proteins" as an inducement for us to buy. These inducements are pseudo-scientific arguments, theories, or vague clinical generalizations. In one circular we are told that the treatment of disease *to-day* is non-specific, or at least relatively so; in another a different non-specific protein solution is highly recommended for each disease, including some as diverse in etiology and course as tuberculosis, asthma and diabetes. The indiscriminate or careless employment of these preparations thus recommended to us, promise greater financial return to the companies than benefit to the patient; and any benefit obtained is not far removed from real danger, even death.

It is unfortunately true that a patient may suffer from certain of the diseases mentioned and fail to respond satisfactorily to treatment. Many will under these circumstances express a desire "to try anything that promises even a prospect of relief." The patient, in giving us this carte-blanche, does so with the tacit reservation that our methods will be tempered by clinical experience and scientific knowledge and not guided by the cure-all circulars issued by manufacturing pharmacists or commercial laboratories.

REFERENCES

(1) COWIE AND GREENTHAL, *Studies on the Nature of the Action of Non-Specific Protein in Disease Processes. Jour. Med. Research,* 1922, XLII, 21. (2) KROSS, I., *An Experimental Study on the Effects of Protein Injection upon Infections, Jour. Med. Research,* 1922, XVIII, 29.

A. H. W. CAULFEILD,
Connaught Research Laboratories

Treatment of Carbon Monoxid Asphyxia by Means of Oxygen + Co^2 Inhalation.—At a meeting of the Commission on Resuscitation from Carbon Monoxid Asphyxia on Nov. 15, 1921, Yandell Henderson and Howard W. Haggard, New Haven, Conn., were appointed a sub-committee to conduct investigations both in the field and in the laboratory on the treatment of carbon monoxid asphysia by the inhalational methods described. The principal treatments heretofore proposed for carbon monoxid poisoning are bleeding, transfusion, artificial respiration and oxygen inhalation. There is no adequate theoretical reason for bleeding in this condition, but rather the contrary; fot it is probably injurious by further depleting the oxygen-transporting power of the blood. Transfusion of normal blood is probably quite ineffective; for in order to be beneficial, it would need to be performed within one, or at most two, hours after termination of the gassing; and this is in most cases quite impracticable. The authors urge that manual artificial respiration by the prone pressure method should be employed, when respiration has stopped, to start spontaneous breathing. This object may be assisted by administering oxygen plus carbon dioxid simultaneously. Inhalation of oxygen and 5 per cent. carbon dioxid, by causing a very full ventilation of the lungs, rapidly eliminates carbon monoxid from the blood and thus terminates the condition of asphyxia. This treatment is highly effective, inducing rapid and complete recovery, if applied early enough. It requires merely general medical supervision, and may be safely and efficiently carried out by intelligent men of the type composing the emergency crews of a city gas company. Until more definite knowledge has been obtained regarding the conditions in the lungs, brain and elsewhere, subsequent to gassing, and until treatment can be based on such knowledge and has been tested experimentally, it is considered inadvisable to apply any specific treatment in postasphyxial gassing cases. The evidence here reported indicates that oxygen plus carbon dioxid inhalation and rapid elimination of carbon monoxid greatly decreases the liability to nervous and pulmonary asphyxial sequelæ.—*Jour. Am Med. Assoc.*, Sept. 30, 1922.

Correspondence

THE QUEBEC WORKMEN'S COMPENSATION ACT —THE UNOILED COG

To the Editors: The need of a Quebec Workmen's Compensation Act, which provides for some compensation for the medical attendant who cares for the employe in a hospital, is urgently felt. In fact there is no adequate provision for the payment of services to an injured employee, though contractors and employes of labour are, by law, required to furnish medical attendance. In large cities like Montreal the onus falls on the hospitals and the attending surgeons who do the staff work. During the construction of a large building in the summer of 1922, in Montreal, many injured were treated at a leading general hospital. The contractors paid a medical man to attend minor injuries and do minor dressings. He saw all those who were injured when possible. A falling workman sustained a fractured skull, and was sent to the hospital in an ambulance. The hospital admitted him to the public ward, where a surgeon elevated depressed bone, and ultimately restored him to his occupation. During his hospital stay a medical man interviewed the man and the surgeon, and returned a report to the Insurance Company who paid this medical advisor for reporting on the claim. The hospital was paid by the employer, also the ambulance, and he also paid his local medical attendant at the building. The surgeon who did the cranial operation was the only one in the chain of events for whom no provision was made.

In British Columbia, Ontario, and other provinces the law provides that some compensation shall be rendered for such attendance. In Quebec we lack any such provision, and in the reframing of legislation regarding the Workmen's Compensation Act as well as for hospital services to the indigent sick of small municipalities in this province, the medical profession should be considered. The newly formed Quebec Medical Association should properly undertake this as it affects every member in it. Our most westerly province has an excellent, well-working act, which would appear applicable to this province. The matter is one that our various medical societies could very properly attempt to bring before the Provincial Legislature in the immediate future.

A Quebec Surgeon

Montreal, October 21, 1922.

MECHANICAL CONDITIONS FAVOURING INFECTION

To the Editor: I have read with considerable interest Dr. H. Ernest Paul's article on "Bone suppuration the basic cause of Renal Calculus in twenty cases following war wounds," as in my own work among the same class of patients, I have been struck with the frequency, not necessarily of calculi, but of unilaterally infected kidneys in some of these patients. This particular type of patient is one with a stiff lower limb following a compound fracture of the femur, gun shot wound, or even some injury to the knee. Patients of this type have naturally had a prolonged period of treatment and most probably suppuration. The factor, however, which has most impressed me as a possible cause of this infection is, not the infecting agent itself, but the probability that a very definite mechanical condition may have arisen, inasmuch as the immobile or only partially mobile limb has seriously disturbed the symmetry of the body and altered the natural position of the kidney, so that retention is favoured.

It is doubtful if microbes should shoulder all the blame; in fact considering that the great majority of people live and die without any infection of their urinary tract, the conditions which permit infection must be fairly definite. One can imagine an invasion of microbes in such numbers, or of such virulence that no tissue could withstand them but this must be an unusual or even a hypothetical occurrence. Micro-organisms as a rule develop in the body in injured tissues or in secretions so altered as to offer diminished resistance to their growth. Microbes do not grow on pure proteins.

J. Ewart Campbell.

Vancouver, Sept. 25, 1922.

Abstracts from Current Literature

MEDICINE

The Treatment of the Syphilitic Liver and Heart. Wile, Udo J. *Amer. Jour. Med. Sci.*, Sept., 1922.

The author emphasizes the need of special care in the specific treatment of cardiac and hepatic lues. The routine administration of salvarsan in these cases is not without its dangers. Indeed, there is considerable doubt as to its efficacy at all. Dangerous results sometimes have followed the indiscriminate use of salvarsan in these cases. In cirrhosis of the liver, for example, there are certain mechanical factors which are of vital importance in the treatment of the disease, and effect prognosis. Thus, fibrosis is materially hastened by energetic antisyphilitic treatment, and the result may be to hasten the disease rather than to retard it. In cases where gummatous tumours predominate, the energetic treatment is often most successful, whereas, on the other hand, where interstitial lues predominates the success is worse than dubious. Patients may improve as to the syphilis itself but may become worse and die from cirrhosis.

In the absence of laboratory data giving us a clue as to the functional capacity of the normal and the diseased liver, it seems injudicious to employ any form of therapy in which the ultimate process of the disease is affected, so to speak, by the treatment. To a certain extent the same thing occurs in syphilitic myocardial degeneration. The fibrosis may be hastened, while the specific lesion itself may be improved. A remarkable improvement sometimes follows only to be superseded by rapid deterioration, with evidences of accentuation of the original cardiac defect.

For this reason the author holds to the view that arsphenamin and similar preparations are not without their dangers in visceral lues, and prefers medication by mercury and iodide, whose action, again, is slow, and therefore less dangerous. The slow process of repair places less stress upon the normal functioning activities of the viscera, and it would seem wiser to use mercury and iodide as preliminary irritants before adopting the more rapid method by salvarsan.

C. F. Martin

Observations on Angina Pectoris.. Levine, Samuel A., J.A.M.A., September 16th, 1922. Vol. 79, No. 12.

From a close clinical and pathological study of 103 cases of angina pectoris a few observations have been recorded. The disease is more common in men than in women. It is rarely found in poorly developed or undernourished individuals. In only six cases was there any history or clinical evidence of syphilis; it would seem that this as an etiological factor has been overestimated. Organic valvular disease is rarely an associated condition. In the majority of cases there are no murmurs. The blood pressure is as a rule high, averaging 160 systolic and 90 diastolic. In most cases the heart is hypertrophied. Only one case showed persistent auricular fibrillation. Comparing this with the usual myocardial conditions, there seems to be some incompatibility between angina pectoris and auricular fibrillation. A. H. MacCordick

Psychoanalysis and its Critics. Meagher, John F. W. *Psychoanalysis Review*, July, 1922.

Before reviewing the chief criticisms directed against psychoanalysis the writer offers his opinion about its principles and practice. The unconscious, he states, is essentially our historic past and our real psyche. Psychoanalysis survives or falls on the theory of the unconscious. Its chief field lies in the diagnosis and treatment of the neuroses and in certain phases of the psychoses. In these, psychological determinants are the most important factors. Metabolic disturbances may be found, but they are secondary to the psychogenetic elements. By means of analysis these are laid bare and the patient gains insight into the cause of his neurosis. He learns to see himself as he really is, and secures greater mental freedom and moral independence. Much of the adverse criticism of psychoanalysis, the writer claims, is based on prejudice and lack of knowledge. Wild psychoanalysis, as carried on by quacks and unqualified persons, is no proof of falsity of Freud's theories and is an abuse of a procedure of real value. An eminent psychologist, Dunlop, of Johns Hopkins, a severe critic of psychoanalysis, declares that it is linked up with mysticism. Mysticism, the writer states, is a third kind of knowledge which is intransmittable, but psychoanalysis makes no such claim. Anyone can learn psychoanalysis if he will but give it time and attention. Perfection, however, can only be attained by years of hard study.

Like any other therapeutic method, medical or surgical, psychoanalysis can do no harm if improperly employed, i.e. if cases are improperly selected, technique faulty, or the analysist inexperienced. The writer quotes Jung's statement that the objections to the sex theory are not intellectual, but originate from moral indignation, felt by most people, at anything sexual. But a method cannot be rejected on aesthetic grounds only, and all well known psychopathologists admit the great importance of sex in the neuroses. A. G. MORPHY

OTOLOGY and RHINO-LARYNGOLOGY

Disease of the Otolith Apparatus. Hunter, Robert J. *J. A. M. A.*, March 6th, 1922.

The writer thinks this is the second case so far reported in literature, the first having been cited by Barany. The clinical history is fully given but does not lend itself well to abstracting. The interesting features of this case, Hunter says, are the following:—

(1) The history of incidence of nystagmus after a blow.

(2) The significant fact that this had continued twelve years, and that, except in his "favorite position," the nystagmus was constant and that there has been no vicarious symptoms of function such as we find after injury to the semicircular canals.

(3) The nystagmus was almost entirely absent in his "favorite position" but resumed constantly as soon as the head was moved from this plane, no matter how slowly and carefully it was moved, and at the same time the past-pointing which was normal in his "favorite position" became abnormal in other positions.

P. G. GOLDSMITH

The Diagnosis of Brain Tumours by the Barany Tests. Fisher, Lewis. (With reports of cases proved by operation or necropsy). *J. A. M. A.*, March 20th, 1922.

This paper calls attention to, and emphasizes the value of, a complete ear examination as an aid to the neurologist and brain surgeon. Examinations of a large number of brain cases over a period of many years have shown that lesions in certain locations produce a definite group of phenomena on stimulation, more definite for some lesions and less definite for others. Tumours, however, situated in the cerebellopontine angle give the most constant complex of findings and in many cases offer the only means of accurate localization. The Barany tests are practically absolute and may lead to accurate diagnosis before any definite and discernable clinical data are available.

The typical picture in brief is as follows. There is total deafness with no response whatever from the horizontal and vertical semicircular canals on the affected side. On the opposite side the hearing is good, the vertical canal produces no response at all while the horizontal canal produces good nystagmus, vertigo and past-pointing.

Tumours of the posterior fossa generally show rather definite findings on vestibular examination. The vertigo and past-pointing are particularly affected, while the eye responses are normal or exaggerated. Fisher believes these tests to be of great value in the differential diagnosis between a subtentorial or supratentorial lesion, but are helpful to a lesser degree in lesions of the middle or anterior fossa.

Pituitary body neoplasms exert their first pressure against the vestibulo-ocular tracts. Examination of a large number reveals an exaggerated nystagmus, but normal vertigo and past-pointing. P. G. GOLDSMITH

Syndrome of Malignant Tumours of the Nasopharynx. New, Gordon B. *J. A. M. A.*, July 1st, 1922.

At the Mayo Clinic during the past six years, New has examined seventy-nine cases. These tumours include only epitheliomas and lymphosarcomas, not fibrous or myxomatous. From a study of this series he believes they are much more common than we think and in many cases have very slight nasal or naso-pharyngeal symptoms. Many patients are treated without discovery of the tumour because the syndrome which is present is not generally known.

Only thirty-eight of the seventy-nine patients presented nasal or naso-pharyngeal symptoms such as bleeding or nasal obstruction. Twenty-one had symptoms referable to the eye, diplopia due to paralysis of the external rectus being the most common. Twenty-nine complained of the ears, pain, deafness, tinnitus or fullness. Enlarged glands in the neck were present in fifty-one patients, extensive involvement often being associated with a small primary growth. Seventy-nine operations had been performed on these patients without the naso-pharyngeal disease having been discovered. The writer says the syndrome presented is quite typical and the finding of a small naso-pharyngeal tumour will usually clear up the diagnosis in cases in which it had previously been impossible.

This paper is illustrated and an abstract of the discussion is added. P. G. Goldsmith

The School Child Before and After Tonsil and Adenoid Removal. Davis, Littleton. *J. A. M. A.*, April 22nd, 1922.

This is a statistical study of 7500 children with reference to the effect of time and natural development of the child on the pharyngeal lymphoid tissue. After two years of observation, he makes the following conclusions: (1) In spite of thorough operations, cervical glands enlarge as often after as before tonsil removal; (2) The incidence of heart disease in children referred for tonsil and adenoid operation is very small; (3) Seven to ten years of age is the period at which one may expect greatest relief from operations; (4) Early removal gives mechanical relief for a time but the original cause of the growths, whatever it may be, is present and active until a much later period.

P. G. Goldsmith

Local Spasm of the Oesophagus and Impairment of Deglutition Following Local Injury of the Pharyngeal and Oesophageal Mucosa. Carlson, A. J. *J. A. M. A.*, March 18th, 1922.

The patient while working on a problem in physiological chemistry, received a boiling concentrated solution of sodium hydroxide in the back of the throat without its having touched the lips or anterior part of the tongue. Within five minutes the throat was swabbed with dilute acetic acid, but five minutes later he was unable to swallow. Marked oedema of the epiglottis and ventricular bands took place twenty minutes later. Deglutition was impossible for five days and, when in a small degree restored, it was found that about one-third of the epiglottis was sloughed. Body weight was reduced 20% in six weeks. As only fluids could now be swallowed the œsophagus was dilated, after the method of Sippy, and dilatation was eventually followed by normal swallowing.

P. G. Goldsmith

A Pedunculated Lipoma of the Oesophagus. Vinson, Porter P. *J. A. M. A.*, March 18th, 1922.

S. V. J., aged 62 gave a history of having coughed into his mouth an elongated piece of flesh which was thought to be a growth attached to the uvula. The growth was easily swallowed but his throat felt sore and swollen for several days.

He had no further trouble for six years, when following a heavy meal he became nauseated and in vomiting ejected a piece of tissue long enough to protrude into his mouth. He tried to bite it off but lack of teeth prevented him, and he again swallowed the tumor. His throat felt uncomfortable and his breath was very offensive for a few days. Three weeks later a similar accurrence took place. At no time was there any dysphagia.

Oesophagoscopic examination revealed a tumour just below the introitus attached to the right wall of the gullet by a pedicle ⅜ inch in diameter. No attempt was made to pull the tumour out of the mouth at that examination but following breakfast a week later, vomiting was induced and the tumour again regurgitated. It extended four and a half inches beyond the incisor teeth, and the tip measured 2 9-16 inches in circumference, gradually tapering to the base. It was rather firm and covered with normal mucous membrane, except for a small ulcerated area near the tip.

Under local anaesthesia the tumour was removed through an external incision in the neck. The raw surface left by the severed base was closed with normal mucous membrane. A small drain was inserted which was removed in seventy-two hours and the neck healed without infection. The length of the tumour after removal was found to be 8¾ inches and a section showed it to be a simple lipoma. In a search of the literature, Vinson has been unable to find a similar case. Excellent illustrations accompany this paper. P. G. Goldsmith

SURGERY

The Early Signs and Symptoms of Cholelithiasis. Moynihan, Sir Berkley. *Brit. Jour. Surg.*, July, 1922, p.127.

In this article the writer draws attention to the many conditions of gall-bladder disease which may simulate, very closely, gall-stones. Occasionally cases diagnosed as cholelithiasis have been operated upon and no gall-stones found. Such cases the writer now regards as examples of early gall-bladder disease and shows from his own experience that cholecystectomy is required for their relief. This type of case includes the various stages of the "strawberry gall-bladder" characterized by inflammatory changes associated with the deposit of lipoids and cholesterin esters in the stroma of its mucosa. He also points out that the symptoms so commonly associated with impacted or floating gall-stones are really those of cholangitis or infection of the gall-bladder. Stones in the gall-bladder or bile ducts very often do initiate or aggravate such an infection which may exist in varying degrees in the absence of gall-stones. Infection of the gall-bladder may occur through various channels.

(1) Very rarely it may ascend from the duodenum. Pigments introduced into the rectum after cholecystostomy have been recognised soon after in the bile drainage.

(2) It may descend from the liver. The writer emphasizes the fact that organisms may reach the liver by the portal system not only from the digestive tract, but also from the spleen. He mentions the close associations, clinically, of splenic enlargement and gall stone disease, and cites a case which was cured by irrigation of the biliary ducts (which were previously filled with sand) by Carrell's method, and by splenectomy.

(3) It may reach the biliary passages by the blood stream. It has been proved experimentally that some organisms, chiefly streptococci, have an "elective affinity" for the gall-bladder and bile ducts. B. typhosus reaches the gall-bladder by the blood stream, and not by the bile. Gosset and others are quoted as having shown that gall-stones may sometimes originate inside the villi of the mucosa, later becoming detached as their size increases.

(4) By way of the lymphatics infection may reach the gall-bladder. Not infrequently inflammatory changes in the liver accompany cholecystitis. Sudler is quoted as having shown the intimate connection between the surface lymphatics of the liver and those of the gall-bladder. A close association with the lymphatics of the pancreas has also been demonstrated.

(5) Infection of the gall-bladder by direct continuity may occur as in cases of gastric or duodenal ulcer with the gall-bladder adherent to them.

Examination of a large number of gall-bladders, shows that infection begins as frequently on the mucous surface as it does on the peritoneal covering. Subperitoneal deposits of fat are frequent even in early cases. Gall stones are found only in the later stages of infection and may be formed either within the cavity or within the walls of the gall-bladder.

The writer firmly believes, however, that gall stones do cause symptoms but not those commonly ascribed to that condition in text-books. These symptoms are entirely referable to the stomach and include flatulence, distress after eating, "acidity," "waterbrash," nausea, and the feeling that the stomach is overfull even after a small meal. Their persistence is even more suggestive.

A solitary cholesterin stone is present in some cases without evidence of antecedent infection and causes no symptoms until it becomes impacted in the cystic duct. This is mentioned as the one exception to the writer's statement that infection is always associated with gall stones.

The pathology of these early changes is very interesting and amounts to a loss of colour and lustre on the part of the gall-bladder followed by the whiter and more opaque appearance of its walls which are slightly thickened. Deposits of subperitoneal fat occur and later there appear oedema, patchy reddening and adhesions. The bile is thicker and darker than normal. The mucosa is oedematous and of the "strawberry" type. The later stages show ulceration, diverticula and sometimes papillomata. Still later cicatricial tissue appears.

H. Maitland Young

A Comparison of Cholecystostomy and Cholecystectomy. Sherren, James. *Brit. Jour. Surg.,* July, 1922, p.135.

It is the author's opinion that there is an extremely scant basis for controversy between the relative merits of cholecystostomy and cholecystectomy, and he undoubtedly favours the latter. A great change of opinion on this subject has occurred during the last ten years. In his own experience, one decade ago, he removed 29 gall-bladders in 100 cases of cholelithiasis. In contrast, he states that he has removed 94 gall-bladders primarily and two more secondarily after a very short interval in his most recent series of 100 cases. Moreover, he claims infinitely better results from cholecystectomy both in regard to the immediate death rate, and also as to the freedom from complications and recurrences.

The principle he has adopted is to treat the disease of the gall-bladder itself and not the products of that disease (e.g. gall-stones). Therefore he advocates cholecystectomy to be done primarily whenever the risk of such an operation is not greater than one consisting of two stages, that is, preliminary cholecystostomy followed by cholecystectomy three or four weeks later. In support of his views he states that in many cases where external examination of the gall-bladder and neighboring lymphatics shows nothing abnormal, cholecystotomy often reveals much. Such conditions as tiny calculi, "strawberry" gall-bladder, small adenomata and even some very early cases of carcinoma would otherwise be overlooked. In all the conditions mentioned cholecystectomy is indicated. In seven cases of cholecystitis with marked symptoms in which no calculi were found, he treated by removing the gall-bladder. All were cured of their symptoms.

He reports 184 cases of cholecystectomy done over three years ago for calculi confined to the gall-bladder with 6 deaths, 3 from lung complications. This series represents 33 acute cases, and symptoms recurred in none.

During the same period 152 cholecystostomies were done for stone, including 46 acute cases. Four deaths resulted. Symptoms recurred in 8 acute cases and in 21 non-acute. 75% of relapses occurred within two years. He reoperated upon 18 of this group, 3 having chronic cholecystitis only. Stones had re-formed in the remainder. In all, the common bile duct was free. Five patients died, within four years, of carcinoma. All his cases were carefully followed up; he communicated with either the patient or his doctor at least once a year.

Cholecystectomy was done in 30 chronic cases for diseases not associated with stones with permanent cure of symptoms, no deaths resulting. Of 9 similar acute cases 4 deaths resulted from gangrene of the gall-bladder. The writer purposely does not include cases of stone in the common duct and states that his procedure in such cases is removal of the gall-bladder and drainage of the duct itself. H. Maitland Young

A Study of 485 Cases With Acute Lesions of the Genitalia. Driver, James R. *J.A.M.A.* September 9th, 1922. Vol. 79, No. 11.

In a series of 485 acute primary lesions 221 were diagnosed positively as syphilis by means of the dark stage illuminator, while 117 considered as negative were proven later to have been chancroids. The clinical diagnosis of primary syphilis is not satisfactory. The most efficient means at our disposal is the dark stage. This is positive several weeks before the Wassermann reaction develops. In cases of negative dark stage findings, however, repeated subsequent Wassermann tests should be done. If local antiseptics are used, the chance of positive dark stage findings is greatly reduced. Among the cases met with giving negative tests for syphilis were: 1 of carcimoma, 3 of tuberculosis, 1 of kraurosis, 5 of scabies, 7 of folliculitis and 11 of balanitis, the latter being due apparently to strong "preventive" antiseptic solutions. A. H. MacCordick

ANAESTHESIA

The Anaesthetic Properties of Pure Ether. Steele, Raymond L. and Bourne, Wesley. *Jour. Amer. Med. Ass.* July 29th, 1922, p.375.

It has been stated recently that pure ether owes its anaesthetic properties to the presence of impurities such as ethylene, carbon dioxide, and ketones, and that ether itself is not an anaesthetic. These impurities may be formed during the Williamson sulphuric acid, alcohol process, the usual way in which ether is made. To test the truth of this statement the authors prepared ether by bringing sodium ethylate and ethyl iodide together in alcohol solution. The only impurities contained in their ether were .04% gethylene and a still fainter trace of ethyl iodide.

In six cases where this ether was used the induction and maintenance of anaesthesia was found very satisfactory. No preliminary morphia and atropine having been used, induction was short and not unpleasant, there were no signs of irritation such as salivation, holding the breath, coughing or struggling. The course of anaesthesia was quiet and uneventful and recovery rapid and uncomplicated.

W. B. Howell

The Suprarenal Gland in Anaesthesia. Corbett, J. S. *Jour. Am. Med. Assoc.* Aug. 12th, 1922.

The writer belives that there is epinephrin exhaustion in certain cases which take ether badly, such as cases of typhoid, starvation, haemorrhage, severe infections, late intestinal obstruction, shock and exopthalmic goitre. Epinephrin exhaustion is also a result of prolonged etherization apart from any other condition. Vasomoter balance is maintained ordinarily by minute amounts of epinephrin in the blood. In haemorrhage vasoconstriction takes place as the result of the pouring out of an increased quantity of epinephrin and the blood pressure is kept up to a certain extent till the epinephrin is exhausted when fall of blood pressure and collapse take place.

The writer made 350 experiments in animals with a view to studying the residual epinephrin after various procedures, and after death from various causes. A table is given showing his results. The amount of epinephrin in the adrenal of a normal animal is taken at 100%. After death from haemorrhage there was found to be only 26%. After one hour's etherization 33%; after chloroform 35%; after nitrous oxide for four hours 65%.

Corbett believes that when there is exhaustion of epinephrin there is nothing with which shock can be controlled unless we increase blood volume by transfusion and so obviate the necessity for vaso constriction. Epinephrin exhaustion from ether anaesthesia is diminished by the use of morphine. He ascribes the comparative safety of nitrous oxide to the fact that it does not exhaust the epinephrin to the same extent as does chloroform or ether.

W. B. Howell

How Apothesine Compares With Other Agents Used in Spinal Analgesia, With Special Reference to a Threatened Accident in a Case of Prostatectomy. Gelpi, Paul J. *New Orleans Med. and Surg, Jour.* Feb. 1922. Vol. Lxxiv., p.586.

The writer has used spinal analgesia in 1200 cases. He has used cocaine, stovaine and tropococaine as well as apothesine and finds the last named as satisfactory as any of the others. Analgesia appears in four or five minutes. The intensity and the duration are entirely adequate. The after effects are slight; occasionally a transient headache, nausea, rarely vomiting. Retention of urine occurred in a few cases, but was probably due to the nature of the operation.

Experiments on animals have demonstrated that its toxic action is similar in kind and degree to that of novocaine. Adrenalin is its most prompt and powerful antidote.

Gelpi reports a case of enucleation of the prostate where he used apothesine. The patient became pulseless immediately after the injection, respiration became laboured and the colour ashy. However, the patient responded to stimulation by digitalin, strychnine and ammonia and recovered. He thinks that in this and two other somewhat similar cases the symptoms may have been due to the head being too low.

W. B. Howell

Some Ophthalmologic Manifestations of Diseases of the Nervous System.—Joseph P. Israel, Tex., states that every patient complaining of headache, especially of migrainous type, should undergo refraction and the diet should be regulated or watched, as this condition is frequently due to an astigmatic error or some disturbance in the gastro-intestinal tract. In the examination of the ocular muscles, it is well to bear in mind the importance of convergence paralysis, as it is a symptom more common than is generally believed, and frequently of syphilitic origin.—*Jour. Am. Med.*, Oct. 7, 1922.

News Items

ALBERTA

ALBERTA MEDICAL ASSOCIATION

THE annual convention of the Alberta Medical Association was held in the Medical Building of the University of Alberta, Edmonton, September 6th, 7th and 8th, 1922.

September 6th at 10.15 a.m. the President, Dr. Archer, called the meeting to order. As there was not a quorum present, business could not be proceeded with, but the president outlined for informal disussion the problems relating to an extension of the Workmen's Compensation Act to cover farm labourers and transients. Dr. Swartzlander gave an outline of the circumstances in the dried out areas where a moratorium has been declared to cover farmers. At the present time, doctors are not classed as preferred creditors and cannot collect any fees. He gave notice that he would move for the appointment of a committee to wait on the government with a view to obtaining this privilege for doctors.

Dr. Harold Brown advocated an alteration in the health act, making the municipalities responsible as backers to guarantee payments of medical bills of indigents and residents in drought areas.

It was stated by Mr. Hunt that according to Mr. Stirling, chairman of the Workmen's Compensation Board, all miners must come under the W. C. B. for accidents. All contracts made between mine operators and doctors must be approved by the W. C. B. Mr. Hunt also read a report of the Executive Committee for the past year, and afterwards reported the suggestions made by various doctors throughout the province.

The result of the recent plebiscite on suggested changes in the Workmen's Compensation Act was as follows:

1. Would you be in favour of enlarging the scope of the Workmen's Compensation Act to include regular hired help on farms? Majority for 8.

2. Would you include ordinary transients or floaters? Majority against, 3.

3. Would you include farmers and their sons? Majority against, 109.

4. Should sickness in the workman be included under the Act in addition to accident as at present? Majority against, 29.

5. Would you include the family as well as the workman under the enlarged scope of the Act? Majority against, 106.

6. If care for sickness were provided for, should that come under the jurisdiction of the Department of Health, instead of the Compensation Board? Majority for, 30. The meeting then adjourned.

The second session of the Convention opened at 2 p.m.

Dr. McMannus of Bashaw read a paper entitled "The Medical Officer of Health," pointing out the difficulties of the country practitioner in carrying out the duties of a health officer. He advocated the appointment of specialists not otherwise engaged in medical practice, where possible, as medical officers of health. They should be highly trained men of independent position, politically and financially. Their districts and duties should be clearly limited and defined.

Dr. Bazin, of Montreal, then delivered the Lecture on Surgery. His subject was "Destruction and repair in injuries of bones and joints with clinical application in the treatment of compound fractures." Eighteen bone specimens from the Canadian War Museum were exhibited to illustrate the lecture. Dr. Bazin pointed out that the principles employed in military surgery during the late war are practically all applicable to civil practice. After much experimental work there was a return to what might be called physiological methods. After showing the gross specimens, a series of lantern slides made from their specimens was thrown upon the screen. The pathology of these specimens was pointed out and explained with an outline of the treatment indicated. He stressed the mechanical cleansing of wounded tissues including bone, and advised the removal of devitalized bone fragments. He pointed out that bone received its chief supply of nutriment from the medulla, and a lesser amount from the periosteum. In young bones the chief sources of repair were from the cancellous bone, and from the deep or osteogenetic layer of periosteum. He advised the removal of all detached bone fragments, and also the ends of large fragments from which the periosteum had been stripped. He then outlined the open and the closed methods of treatment for infected joints.

Prof. McPhee, of the University of Alberta, outlined the course of Medical Psychology as given by the University of Alberta. He then proceeded to a definition of the neuroses and their classification, accepting the classification of Freud, without accepting or rejecting Freud's sexual theory of origin.

Dr. MacKay of New Westminister, B. C. read a paper on "The diagnosis of early mental conditions."

A joint public meeting of A.A. of R.N., A.H.A., and A.M.A. was held in Convocation Hall,

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University Building, Wednesday evening, 8.30. Rev. Father Cameron, of Calgary, occupied the chair. Acting Mayor Bury, of Edmonton, in a felicitous address congratulated the members of the various organizations represented at the joint meeting in their efforts for the health of the community, and gave them a hearty welcome to the city. Dr. Stockton, of Calgary, presented a paper on "Everyday Paediatrics." He suggested the less frequent use of drugs; great many had been overworked to the detriment of the child. Common sense and science would bring best results. In cases in which the mother's milk was insufficient for the needs of the child, additional feeding should be given immediately, and so as not to increase the frequency of the feedings.

Hon. R. G. Reid brought greetings and commented highly on the work that is being accomplished in Alberta along health lines. He considered the problem of public health almost entirely a question of education. Dr. Archer of Lamont, President of the Alberta Medical Association, gave an interesting talk on the advancement of medical science during the past few decades. The high death rate of infants in Alberta was largely due to parental lack of knowledge, and it was up to the medical men to educate the parents. The Medical Association was arranging a Health Week this Fall with a view to giving the public some information along the lines of preventable medicine, cancer, tuberculosis, and venereal diseases. Dr. Stanley of Calgary, President of the Alberta Hospital Association, discussed the question of the efficiency of the hospitals in the province. While Alberta was ahead of any other province in Canada, in health matters, yet much remained to be done before the whole population was reached. Doctors, nurses, and hospitals working together were necessary for success, but in many places no hospital accommodation was provided. The large cities had efficient hospitals and there were many other hospitals owned and operated by private corporations, churches, etc. as well as good rural municipal hospitals, doing invaluable work, but the present system would have to be changed before hospitals would be within the reach of all. In many places the difference between the fees paid by residents and those living outside the hospital district were so great as to almost bar the sick from hospital assistance. Some system should be devised whereby all would have equal privileges, and a general fund created to more equally distribute the burden of taxation. It must be locally governed, but to a greater extent provincially assisted and such assistance on the basis of earned grants similar to school grants according to actual service rendered, and not upon the flat rate as at present.

On September 7th, from 8-11 a.m. clinics in medicine, surgery, and the various specialities were given at the general hospitals. At 11 a.m. Dr. A. T. Bazin gave a Clinical Demonstration on Differential Diagnosis in Acute Abdominal Conditions.

In the afternoon Dr. Learmonth of Calgary read a paper on the Early Diagnosis and Treatment of Carcinoma Uteri. He pointed out that the majority of cases were diagnosed only when too late for treatment, and urged the education of women to recognize the early signs and symptoms. He outlined the causes and modern treatment and urged medical men to disseminate as much information on the subject as possible. Dr. Malcolmson of Edmonton read a paper indicating the recent advance in diagnosis and treatment by x-ray and radium giving a summary of the results of his own experience in these lines. Dr. Gilmour, of Winnipeg, gave a lecture on "Diabetes Mellitus." He divided the treatment into two stages, (a) a preparatory stage where the efforts are directed towards freeing the urine of sugar; (b) Active dietetic treatment after obtaining a sugar free urine, gradually raising the threshold of tolerance for fats and proteins. Prof. Collip, University of Alberta followed with an outline of the investigations carried out by himself and associates which has resulted in the discovery of the internal secretion of the pancreas which they have named "Insulin." He demonstrated the action of insulin on rabbits and the neutralizing effect on a hypodermic injection of sugar. The marvellous results were almost instantaneous.

At 5.30 p.m. the Convention went into a business session.

On motion of Drs. Swartzlander and MacDonald the report of the special Committee appointed to consider medical collections in the drought area was adopted.

The following two resolutions from the Alberta Hospitals Association were endorsed:

(1) Moved by Dr. H. R. Smith and seconded by Dr. G. D. Stanley, that whereas it is universally recognized that the supplying of facilities for educating and training pupil nurses is a public service, the adequate performing of which entails considerable outlay to the hospitals maintaining training schools; therefore be it resolved that "The Special Committee on Legislation" be requested to bring this matter to the attention of the Provincial Government with request that suitable remuneration be provided for hospitals maintaining satisfactory training schools. (2) Moved by Dr. Smith and seconded by Dr. G. D. Stanley, and resolved, that "The Special Committee on Legislation" appeal strongly to the Workmen's Compensation Board to revise the schedule of hospital fees, so as to make the minimum fee conform to the actual average cost per patient per day of operating the hospitals of the Province.

It was moved by Dr. A. R. Munro and seconded by Dr. J. S. Wright and carried that a committee be appointed at this meeting to review the Workmen's Compensation Act with the purpose of making such recommendation re amendments to the W. C. Act in order that this scheme of Workmen's Insurance may be made acceptable to the medical profession. That this committee be asked to bring in a report to a special meeting of the A.M.A. to be called some time prior to the next meeting of the Legislative Assembly. That the proposed amendments be presented to the government before the next session of the Legislative Assembly.

The nominating Committee then presented its report as follows: President, Dr. A. F. Anderson, Edmonton; 1st. Vice-Pres., Dr. Wm. Hackney, Calgary; 2nd. Vice-Pres., Dr. E. W. Allin, Edmonton; Secretary, Dr. W. H. McGuffin, Calgary; Treasurer, Dr. T. J. Costello, Calgary.

On motion, the following resolutions were adopted. (1) That this Association wishes to congratulate Dr. Collip on his work in connection with the production of insulin, and to express its pride in having within its membership a worker who has contributed so much to the alleviation of suffering in diabetes. (2) This Association wishes to place on record its appreciation of Dr. Gilmour's visit, and of the exhaustive and scientific paper which he has presented to this meeting.

On Thursday evening the members of the convention were the guests of the Academy of Medicine, Edmonton, at dinner at the Country Club, where a most enjoyable time was had.

On Friday, September 8th, Clinics were given at the various hospitals from 9 to 11 a.m. Dr. Gilmour of Winnipeg gave a clinic on nephritis at the Strathcona Hospital at 11 a.m.

Afternoon Session at 2 p.m. Two reels of moving picture film were run, showing the development and spread of gonorrhoea and syphilis in both males and females; and an interesting paper was read by Dr. Harold Orr on "Recent developments in the study and treatment of syphilis."

Dr. Emerson Smith of Edmonton gave a paper on Pyelitis. He defined and gave the modern views on the causation of Pyelitis, stating that it was the result of a blood born infection. Cystitis, he stated, was the result of a descending infection from, rather than the cause, of a pyelitis. He stated that bladder symptoms were very frequently an indication of kidney infection, and pointed out that a gonococcal pyelitis was very uncommon, and advised a careful routine examination of the whole genito-urinary tract in all cases. He then gave the differential diagnosis of pyelitis from other confusing conditions. He also gave a short outline of treatment. (1) Find out the source of infection and remove it, usually disorder of colon. (2) Forced fluids by mouth. (3) Alkalinization of urine. (4) Rest. (5) Relieve pressure (strictures, etc.) to give better drainage of ureters. (6) Vaccine. Catheter specimens of female urines should always be taken and cultures of all urines made.

Dr. McPhatter gave some points on goitre. He said there was need of further study of the sympathetic nervous system before the thyroid gland and function are understood. In discussing the anatomy of the thyroid gland he said it was the most vascular of all organs. Its secretions and functions are not understood.

Dr. Stanley outlined the proposed alterations in the Constitutions of the Council of the College of Physicians and Surgeons, whereby councillors were elected for two years instead of four, and four of the seven would be elected in the even numbered years, and three in the odd years. Drs. A. F. Anderson and Costello moved that the annual fee of this Association be twenty-five dollars. Dr. Stanley proposed that Dr. Anderson's motion be amended, to add: but that the executive be instructed to enter into negotiations with the Council of the College of P. & S. with a view to making such financial arrangements with that body as to meet the financial obligations of the Association, as far as the officials and office expenses of the Association are concerned. Approved.

Ninety-three members signed the register, of whom thirty-six were from points outside Edmonton and Calgary. In addition quite a number of men from Edmonton and outside attending only a session or two did not register.

NOVA SCOTIA

An innovation of some interest and importance was inaugurated recently in Halifax, when the Medical Faculty of Dalhousie University gave a short course of post graduate instruction. The idea was the outcome of a meeting of the Maritime Branch of the American College of Surgeons and was undertaken with some little trepidation by the lecturers. It was felt that the Medical School was small and more or less isolated from the greater centres of scientific activity. However, the venture proved to be a complete success. About thirty physicians from various parts of the Maritime Provinces, and one from the United States, were in attendance. The course lasted one week and was free. Medical and Surgical Clinics were held daily in the Victoria General Hospital, in the Halifax Children's Hospital, and in the Grace Maternity Hospital, under the direction of the staffs of the several hospitals including Drs. Hogan, H. K. McDonald, Murphy, McDougall, Kenneth McKenzie, Mack, Eager, Johnston, Curry, Cunningham, Doull,

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Lessel, Muir, Silver, Weatherbe, and P. A. MacDonald. Special lectures were given by Dr. Hattie, P. H. O., Dr. Murdoch Chisholm, and Dr. John Stewart. Demonstrations were given by Profs. John Cameron in Applied Anatomy, and A. G. Nicholls, in Morbid Anatomy. A visit was also paid to the Halifax-Massachusetts Health Centre No. 1.

An added element of interest lay in the fact that 1922 is the fiftieth anniversary of the graduation of the first University class in Medicine, and this event was commemorated by a banquet at the Halifax Hotel, at which eighty-five covers were laid. The sole survivor of this class was present, Dr. Finlay McMillan of Sheet Harbour, N. S., and attended the graduate course. During the course of the proceedings Dr. McMillan was presented with a gold-headed cane by the medical men of the Province. Addresses were given by Dr. A. Stanley McKenzie, President of Dalhousie University, George S. Campbell, Esq., LL.D., Chairman of the Board of Governors, Dr. John Stewart, Dean of the Faculty, and a number of others.

So much appreciation of the course was expressed by the visiting doctors that it is practically certain that a repetition will be undertaken next year, and, perhaps a little more elaborately.

Halifax is an outpost of civilization on this continent, but, perhaps, because of its very remoteness from other scientific centres, is proving to be a rallying-point for the intellectual life of the Provinces down by the sea. The Medical School of Dalhousie University is fortunate in that it possesses an ideal "lay-out" for its special purposes. The various hospitals, general and special, form a coordinated system, placed close together, and grouped about the medical faculty building, in a manner that is rarely seen even in the larger cities. A new laboratory building in which physiology, pharmacology, and biochemistry will be housed is rapidly approaching completion, and an out-patient dispensary and Health Centre has been begun. An extensive addition to the pathological building is projected, and, it is hoped, will soon be undertaken. The Faculty is only waiting for the increased accommodation, in order to make some much-needed additions to its teaching staff. The outlook in Halifax is undoubtedly gratifying and inspiring.

A. G. N.

DALHOUSIE UNIVERSITY—CEREMONIES AT THE LAYING OF THE CORNER STONE OF THE NEW MEDICAL SCIENCE LABORATORY BUILDING

"Dedicated to the glory of God and for the good of man." In the words of Dr. John Stewart, Dean of the Faculty of Medicine, who performed the ceremony, the corner stone of the Medical Science Laboratory Building of Dalhousie University was laid. Simple and impressive exercises marked the occasion. The corner stone is to the right of the main College Street entrance, and bears the following inscription:

This stone was laid by
John Stewart, M.B., C.M., LL.D.,
C.B.E.
Dean of Faculty of Medicine,
1922.

President Mackenzie, in a brief address, took occasion to emphasize the necessity of college confederation from the viewpoint of economy in the rapid development now demanded of Universities. He traced the history of the development of Dalhousie from the old building on the Grand Parade, which had served the demands of Dalhousie for sixty years. Then the building now known as the Forrest Hall was built, and that served the demands of the University for only a generation. In the first half of this generation eight buildings had either been erected or purchased for the needs of the University, and it was not improbable that in the next half of this generation another twelve such buildings will be added to Dalhousie University alone.

President Mackenzie considered that College confederation was most desirable in order to secure the conservation of all resources, and meet the increasing demands of teaching and research in the present day. The President paid tribute to Dr. Stewart, not only as the Dean of the Faculty, but as one, who, though it was the work of younger men, had heard the call to duty in the stress of war and had led the medical forces of the Province.

In describing the uses to which the new building will be placed, President Mackenzie said that it would for the present be used for the study of Bio-Chemistry, Physiology, Pharmacology and Hygiene. It was built as a unit and in time, as the needs of the College required, three other units would be built, providing one for each of the subjects now to be housed in the new building. He sketched how, when this was accomplished, there would be four such buildings, one on each side of the Forrest Hall and the ground on which that building now stands would be converted into a court on which all four buildings would front. This accounted for the fact that the south side of the new building was identical to the College Street front.

Dr. Stewart, using the same trowel with which Lord Dalhousie laid the corner stone of the first Dalhousie Building, over a hundred years ago on the Grand Parade, performed the simple ceremony of dedicating the building. In his brief remarks following the ceremony, Dr. Stewart referred to the spirit of continuity which bound the University: the same spirit inspired the College today as when Lord Dalhousie laid the stone of the first building. The foundation sciences of medicine were to be taught in the building, and "we can well and truly say that it is dedicated to the glory of God and the good of man."

Dalhousie University began the present session on October 5th with an enrolment of 202 students in the Faculty of Medicine. The six years' course is now fully inaugurated. The enrolment in all Faculties is about 750 students.

The post-graduate course offered by the staff of Dalhousie University to the profession in the Maritime Provinces has proved very successful and very well attended.

QUEBEC

McGill University will have this year a Psychological Clinic in charge of Prof. W. D. Tait. His equipment is of the most modern type.

A memorial window has been placed in the Medical Building of McGill University by the teaching staff of the Medical Faculty in memory of the late Lieut.-Colonel John McCrae, Lieut.-Colonel H. B. Yates and Lieut.-Colonel R. D. Campbell. The window designed by Prof. Nobbs, late Professor of Architecture, is placed in the hall on the first floor directly over the main entrance to the building, and is in three divisions. The central portion dedicated to Lieut.-Colonel John McCrae

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displays in the centre, rows of crosses standing on a field of poppies; a jewelled plaque displays a book and a quill. The section on the right dedicated to Lieut.-Colonel Yates shows the town of Boulogne; its plaque bears a microscope. The section on the left to the memory of Lieut.-Colonel Campbell shows a view of the Thiepval front where he was killed in action. The plaque displays a surgeon's knife, bandages and scissors. Above, in the centre light, a radiant sun is shown on the horizon with rays spreading upward and to each side. On the far left strings of maple leaves entwine a group of poplars, on the right are sprigs of laurel similarly grouped.

At the meeting of the Montreal Medico-Chirurgical Society on October 6th, Dr. Reginald Morten, of London England, gave an address on deep x-ray therapy as first introduced in Erlangen. After two years' experience with it, he considered that it yielded good results especially in carcinoma of uterus, rectum and oesphagus. In one case of carcinoma of the oesophagus which he had treated 18 months ago after an operation for gastrostomy had been performed, the patient is able to swallow and is still alive.

The following candidates arranged alphabetically were successful at the recent examinations at McGill as reported by the registrar, Dr. R. W. Powell, of the Medical Council of Canada. This registration is under the provisions of the Canadian Medical Act. which grants a qualification of L.M.C.C. accepted for registration and license in every province of Canada.

The successful candidates are: A. Achpise, Paris, France; H. MacAllen, Toronto; J. M. Baxter, St. John, N.B.; F. G. Beall, Westmount, Que.; E. M. Blair, Truro, N.S.; Jessie M. Boyd, Westmount, Que.; E. B. Chandler, Moncton, N.B.; C. G. Clements, Wapella, Sask.; J. G. Copeland, Cornwall, Ont.; R. B. Coulson, Ottawa; C. T. Coulter, Malone, N.Y.; N. DesBrisay, Toronto; C. L. Emerson, St. John West, N.B.; T. H. Field, Edmonton, Alta.; R. Fitzgerald, Calgary, Alta.; C. Fluhmann, Kenogami, Que.; D. C. Gordon, Ottawa; J. H. Grant, Port Elgin, N.B.; R. S. Grimmett, Edmonton, Alta.; H. Hart, Westmount, Que.; H. F. Howe, Palmerston, Ont.; I. C. Humphreys, Kinburn, Ont.; K. O. Hutchison, Montreal; J. E. Imbleau, Renfrew, Ont.; H. M. Jardine, Moncton, N.B.; F. L. Jones, Ottawa, Ont.; A. T. Kibzey, Winnipeg, Man.; J. M. Kinsman, Wolfville, N.S.; W. Laishley, Ottawa; P. A. Lyster, Red Willow, Alta.; J. McGregor, Victoria, B.C.; J. F. McIntosh, Westfield Beach, N.B.; D. W. McMillan, Westmoreland, N.Y.; E. C. McLeod, Plenty, Sask.; J. S. Murray, River John, N.S.; N. K. Neilson, Arnprior, Ont.; P. L. O'Shaughnessy, Cobalt, Ont.; H. A. Pearce, Edmonton, Alta.; H. H. Sharp, Sussex, N.B.; G. F. Strong, Vancouver, B.C.; N. T. Williamson, Westmount, Que.

THE INAUGURATION OF THE NEW BIOLOGICAL BUILDING OF McGILL UNIVERSITY

The new Biological Building of McGill University, which houses the departments of physiology, biochemistry, pharmacology, botany and zoology, the erection of which was rendered possible by the munificence of the Rockefeller Foundation, was formally inaugurated on October 6th, with a programme of ceremonies which included addresses, a reception and a banquet. The opening addresses, immediately preceded by an address of welcome from the Principal, Sir Arthur Currie, were delivered in the afternoon at the Royal Victoria College by Professor Sir Charles Scott Sherrington, G.B.E., President of the Royal Society, and Waynflete Professor of Physiology, Oxford, who came to Montreal for the occasion, and Dr. Harvey Cushing, Mosely Professor of Surgery in Harvard University. Addresses were also delivered in the morning to an audience of students and members of the Faculties by Dr. F. M. Coulter, Professor of Botany of the University of Chicago, on "The Botanical Perspective" and Dr. H. J. Hamburger, Professor of Physiology in the University of Groningen, Holland, on "A New Form of Correlation between Organs." Amongst the invited guests of the University who attended the ceremonies were Dean R. H. Chittenden, the veteran Professor of Biochemistry of Yale University, Professor W. J. Gies, of Columbia University; Professor Bazett, of the Univerity of Pennsylvania; Professor Thomas McCrae, of the Jefferson Medical College, Philadelphia; Dr. John Stewart, of Halifax, representing Dalhousie University; Dr. S. Grondin, of the Medical Faculty of the University of Montreal; Professors A. Primrose and J. J. R. MacLeod, the Dean and Associate Dean of the Medical Faculty of the University of Toronto, and Professor Spencer Melvin, of Queen's University.

After the formal inauguration, a reception was given to all the guests, visitors, members of the staff and friends of the University in the new building, which was then thrown open for inspection to the several hundred who were present. In the evening a banquet attended by the specially invited guests and the members of the staff was held in the Ritz-Carlton Hotel, with Sir Arthur Currie presiding, at which toasts were proposed to Sir Charles Sherrington and the other special guests, and to the Royal Society, to which Sir Charles and Dean F. D. Adams, of the Faculty of Applied Science, replied.

A special Convocation of the University was held on the afternoon of October 7th, at which the Honourary Degree of Doctor of Laws was conferred on Sir Charles Sherrington because of his contributions through research to physiology and of his distinguished standing in the scientific world. Sir Charles in an address expressed his appreciation of the honour conferred on him by a university of such standing as McGill.

The new building puts at the service of the Medical Faculty of McGill University such accommodation and equipment in its scientific departments as to place it, in this respect, amongst the leading medical faculties of the American continent.

ONTARIO

No. 6. District Medical Meeting of the Ontario Medical Association, comprising the Counties of: Peterboro, Victoria, Durham, Northumberland, Hastings, Prince Edward and Haliburton, was held in Trenton, on Friday, September 29th, Dr. E. A. McQuade of Trenton, Counsellor of the District presiding. The following programme was presented in the afternoon: Abscess of the Lung, (Illustrated by Lantern Slides), F. C. Neal, Peterboro; Osteomyelitis, A. S. Tilley, Bowmanville; Intestinal Obstruction, Geo. Stobey, Belleville; Tetanus, C. V. Mulligan, Lindsay; Malignant Disease of the Uterus, (Illustrated by Lantera Slides), G. Stewart Cameron, Peterboro.

After an enjoyable banquet at the Gilbert House, addresses were delivered by E. R. Seeord, President, and T. C. Routley, Secretary, of the Ontario Medical Association and Mr. Nelson Parliament, Speaker of the Provincial Legislature. The meeting was altogether successful.

No. 2. District Medical Meeting of the Ontario Medical Association, comprising the Counties of: Brant, Oxford, Perth, Waterloo, Wellington, Huron and Norfolk was held at Kitchener, on the afternoon and evening of Wednesday, Sept. 27th, with Dr. Weston Krupp, of Woodstock, Counsellor of the District, in charge. The afternoon session was presided over by Dr. J. P. Giguere, President of the North Waterloo Medical Association, under whose auspices the district met. The following papers were presented: Psycho-analysis in its Relation to Mental Disorders, G. S. Glasseo, Hamilton; Perforation of the Stomach and Duodenum, Hadley Williams, Prof. of Surgery, Western University Medical School, London; Applied Physiology of Internal Secretory Organs, J. J. R. MacLeod, Professor of Physiology, University of Toronto; Arterio-Venous Aneurysm, C. F. Hoover, Prof. of Medicine, Western Reserve University, Cleveland, Ohio: In the evening after an excellent banquet, addresses were delivered by Dr. Secord, President, and Dr. Routley, Toronto, Secretary of the O. M. A. An attendance of between eighty and ninety was manifest evidence of the keen interest taken in the meeting by the practitioners of the District.

GENERAL

The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Senor Alvarenga, and amounting to about Three Hundred Dollars, will be made on July 14, 1923, provided that an essay deemed by the Committee of Award to be worthy of the Prize shall have been offered.

Essays intended for competition may be upon any subject in Medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by the Secretary of the College on or before May 1, 1923. Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author. It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award. JOHN H. GIRVIN, *Secretary*, 19 South 22d Street, Philadelphia, Pa. U.S.A.

Treatment of Tuberculous Cervical Adenitis.—Richard H. Miller, Boston, states that there is no certain therapeutic agent, no absolute specific, and no set rule for treating tuberculous cervical adenitis. To lay down a definite scheme, and treat every case thereby is, in his opinion, not productive of the best results. Each patient must be carefully studied and considered as an individual, and then, by the judicious application of five chief methods, hygiene, light, radiation, surgery and tuberculin, either singly or in combination (for each has its place), it will be possible, to approach, as nearly as possible, a therapeutic goal. When a diagnosis of tuberculous adenitis is made, hygiene and mode of living are investigated, and corrected as indicated. The tonsils and adenoids are removed, unless contraindicated. Acute abscesses are drained. Discrete cold abscesses without acute superimposed infection are opened through a small incision, and drained for a few days with a small rubber tube. Patients with chronic discharging sinuses are treated with tuberculin plus the mercury vapor quartz lamp. Discrete localized glands are at the outset either removed or treated with tuberculin. Extensive disseminated glands, and those showing deep involvement, are treated with tuberculin. If this fails then roentgen ray is tried, and lastly operation.—*Jour. Am. Med. Assoc.*, 1922.

The Acute Painful Back Among Industrial Employees Alleging Compensable Injury.—Trauma, Harold R. Conn, Akron, Ohio, asserts is blameless as an etiologic factor in a large percentage of cases of alleged traumatic back. Malingering is of uncommon occurrence, but often is implied to the surgeon by the patient's false conceptions of etiology and an overanxiety to establish the recognition of a real disability. Osseous abnormalities in the low back furnish a potential group, especially susceptible to violence but capable of developing disability unexcited by trauma. Sacro-iliac relaxations are of infrequent occurrence. Sacrolumbar lesions are properly of two classes as regards the involvement of the articulation, extrinsic and intrinsic, the latter representing the grave traumatic lesions of most common occurrence.—*Jour. Am. Med. Assoc.*, Oct. 7, 1922.

Obituary

JOHN JOSEPH MACKENZIE

An Appreciation by Horst Oertel.

Cita mors ruit! The death of John Joseph MacKenzie has removed—alas, altogether too soon—the senior pathologist of Canada; a founder and pioneer of scientific pathology in the Dominion. For MacKenzie was amongst the first on this side of the Atlantic to recognize and teach pathology as an independent biological science, and not simply as an appendix to the practice of medicine. He brought to it the mature judgment and solid foundations of a thorough scientific training and inspiration, which he had acquired in Toronto under Ramsey Wright, in Ludwig's laboratory in Leipzig, and in Berlin, where the influence of Virchow, Du Bois Reymond and Koch were strongest. These influences and his early and lasting associations with such men as Macallum, MacPhedran, and Clarke helped to shape and maintain his mind in classic frame. True to them and himself he lived and died. For almost a generation he taught, enthused and largely shaped the minds of the students in Toronto. He gave them that broad comprehensive foundation and inspiration without which the practice of medicine ceases to be a scientific profession, and becomes a sterile trade. A clear, straight thinker, a sympathetic teacher and adviser, a true friend, he stood aside from spectacular displays and hectic investigations, an exponent of the soundest critical judgment.

It has been said of Virchow that his greatest accomplishment was to have taught the physicians of his generation to think objectively. Thus also, in the educational battle against ignorance and unreason in medicine, against hasty uncritical generalizations and conclusions, MacKenzie took a leading, perhaps the leading part on this side of the Atlantic. It is impossible to overestimate the value of his sober, even tempered teaching. He was a conservative in the best sense of the term. Not blind to progress and to new ideas, he exercised a masterly restraint in his own work and in accepting that of others.

The aesthetic part of his nature was strongly developed. Of artistic temperament and inclinations, he enjoyed fine things outside of his calling. His personality combined in an interesting and appealing manner characteristics which Canadian soil and life shape out of fine old Scotch descent. His mind was flexible with a strong bend towards the humorous side even in trying situations. When we sat together and he unbent he showed noble emotions. Sympathy with and tolerance of human weaknesses appeared in him with independence and strength of his own views which are rarely found combined in one man. Last, not least, MacKenzie recognized quality and had the courage to proclaim it!

Thus he stands and will always stand before me. To have him removed from us when sober leadership is most needed in academic life is nothing short of a calamity.

Vita nostra brevis est,
Brevi finictur,
Venit mors velociter
Rapit nos atrociter,
Nemini parcetur.

But it is a comfort to know that death may not extinguish his personality. A noble character like his does not end its life with death, but continues in the minds and actions of those who remain, a potent influence on posterity!

Harris Graham, A.B., Toronto University, M.D., Michigan University, thirty-three years professor of pathology and practice of medicine in the American University of Beirut died at his post in Beirut, Syria, Feb. 27th, 1922, in his 60th year. He was born in Ottawa, Canada, and was of Scottish descent. He obtained his baccalaureate at Toronto when twenty years of age, and, on receiving his degree at Ann Arbor, he was the same year commissioned by the American Board of Foreign Missions as a missionary to Turkey, where he arrived in 1885. He married Miss Ella Bray, a fellow missionary, at Constantinople. All Dr. Graham's outfit,—instruments, books and equipment—was lost at sea.

Dr. and Mrs. Graham were sent to Aintab. On the overland journey a kick of his horse broke his leg; but he reduced the fracture himself and continued his journey of several days on horse back. Arriving at Aintab he at once began the study of Turkish, and the teaching of pathology and physiology in the medical school connected with the Central Turkey College, an institution supported by the American Board. After four years of this work, with touring and practising in the summers to raise money to carry on the work, the Turks closed the school. The Turk can endure to see nothing flourish! Dr. Graham was called to the vacant chair of pathology in the American University of Beirut, then called the Syrian Protestant College. Here he served brilliantly for a generation and was called away in the midst of his greatest powers. In 1892, Dr. Graham who for several years taught bacteriology in addition to practice of medicine and had leave to go to Berlin and study in Koch's laboratory; on many other vacations he pursued post-graduate studies in pathology in Berlin and Vienna. Dr. Graham was the first to demonstrate that the culex carries the germ of dengué fever, and first isolated that microbe. Patients came to him from all over the Near East. He was a remarkable linguist, having command of a rich and lucid vocabulary in English and in addition was fluent in Arabic, Turkish, French and German, spoke Italian fairly well and could interrogate a patient in modern Greek and Armenian. He had a sympathetic manner that won the hearts and confidence of his patients. As a teacher he possessed force, inspiration and thoroughness. He used bed-side and case history teaching

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long before it was common in American schools. There are two other Canadians on the Medical Faculty of Beirut; Dr. C. A. Webster, professor of Anatomy and Opthalmology, a graduate of Toronto, and Dr. Douglas Cruikshank. M. B. Adams

Dr. C. S. Moore, of London, Ont. died on Sept. 26th. In him the medical profession lost a great soul and a true physician. Dr. Moore was born in London, on Aug. 26, 1852, and received his education in the old Union School and Hellmuth College for boys. He graduated from McGill University and began active practice when twenty-one years of age. Even before that time, he had been initiated into practice by assisting his father, Dr Charles D. Moore, whose skill as a surgeon helped to shape his son's inclinations. Occasionally, in a reminiscent mood, would some of the incidents of those pre-anaesthetic days be revealed to a fortunate listener. He had an early connection with the Western University and for some years was Professor of Gynaecology, later going to the Senate and more recently acting on the Executive Board of the Institute of Public Health.

His was a magnetic character and a companionable soul. His philosophy of life was inspiring and his humour, and appreciation of the same, unusually keen. He found time to read and was a lover of good literature and an interesting conversationalist. His delight was to be known as a general practitioner and his reward was in the rôle of the family physician. With him has passed away one of those all too few examples of this grand old type, whose memory is an inspiration and an ideal.

He had two hobbies. One was medicine and the other was the youth of his clientele. To the latter he was a tower of strength and a friend indeed, whenever encouragement or a word of friendly advice was in season. He was uniformly kindly, courteous, generous and always ready to help a confrère and none could be wider in sympathy or more cordial in support. He was a firm believer in the value to a young woman of a nurse's training as a medium for character making.

Book Reviews

Endocrine Therapeutics. By Thomas Bodley Scott, cr. 8vo., 118 pages, price 5s. H. K .Lewis & Co. London, 1922.

This excellently printed and bound little book is a credit to its publisher. It is well written and in places deserves its subtitle of "Practical Suggestions" as the author has endeavoured to show how he employs what he understands of the complicated theories of Endocrine Therapeutics. Like the other books of its class it is too enthusiastic and not sufficiently critical. His practical suggestions are not, in many cases, really founded on ascertained fact but on the speculations of such authors as Sajous; nor are case histories and treatment given clearly and distinctly so that they form a real guide to the practitioner. Suggestive this book certainly is, but the reviewer doubts greatly its "practical" value. V. E. H.

Chloroform Anaesthesia. By A. Goodman Levy, M.D., M.R.C.P., p.159, with foreword by Prof. A. Cushny. Price 7/6. John Bale, Sons and Danielsson, London, 1922.

This is an excellent book, well printed and a great credit to all concerned. Levy is a practical anaesthetist who, by years of experimental as well as clinical work, has done much to improve the administration of chloroform as an anaesthetic. His work has, at last, served to explain the chief danger in the administration of chloroform, namely, early cardiac syncope. He has shown that this extremely dangerous condition arises only in light anaesthesia, usually during induction but is possible during recovery from a deeper anaesthesia, and is due to a sudden fibrillation of the ventricles of the heart. This is due partly to (a) the effect of small amounts of chloroform increasing the irritability of the ventricle and (b) also to some other stimulation, such as the administration of adrenalin, reflex effects as in struggling, from surgical interference, or from handling or even from the respiratory passages. He has pointed out how the danger frequently can be avoided and even cured should it occur. Everyone who has occasion to administer chloroform should read this book carefully. He should not be dismayed by the scientific chapters but should carefully follow them as in them many popular theories are disproved. General practitioners will also profit by this book and should note that Levy estimates the danger of death at about one in thirteen hundred and also that he strongly points out the dangers of anaesthesia by chloroform and ether in mixtures or in succession, estimating their death rate as much higher than from chloroform alone. V. E. H.

Endocrine Glands and the Sympathetic System. By P. Lereboullet and others. Translated by F. Raoul Mason, M.D., with the collaboration of Daniel R. Ayres, A. B., M.D. 378 pages, price $6.00. Published by Lippincott Company, 201 Unity Building, Montreal.

The French physician has a special aptitude for clinical description and a fine ability in the analysis of symptoms and the differentiation of clinical complexes. The French authors of this book are splendid examples of their school, and the original work must have been a delight to read and a genuine contribution to our knowledge of the subject. An undue amount of credit however, is given to French workers probably due to unfamiliarity with the work done in foreign schools. The splendid work of Kendall in isolating the active principle of the thyroid, as well as the clinical work which has followed from this discovery is not mentioned.

It is a pity that the translation is so bad. It seems to have been done by some one who is unfamiliar with good English and also of the subject. Actual mistakes or clumsy English occur on almost every page. The use of a singular subject and a plural verb is not uncommon: p. 109, "Toxic tetany are very rare." New words are also invented: p. 136, "*Comatous* phenomena" :p. 135, "are really pure cases of adrenal insufficiency slowly *evoluting*." "Evoluting" is a favorite word of the translator. Who has heard of "Glycosuria tremors?" p. 151, the sentence, p. 134, "The urines are decreased in quantities" has a peculiar ring to English ears as has the phrase p. 93, "theoretical facts." The ignorance of the translator makes the meaning of many passages doubtful and in some cases unintelligible without both knowledge and thought. The proof reading has been done none too well, and the American habit of printing gastro-intestinal or non-toxic as two words without hyphens is distinctly unpleasing to English eyes. It is unfortunate that the book as printed should have been published by a good firm.

While the book can be recommended to the Canadian reader for its clinical descriptions, he will find the terminology often unfamiliar and, in the chapter on the sympathetic system, where a purely personal nomenclature is used by the author, so confusing as to make it valueless. V. E. Henderson

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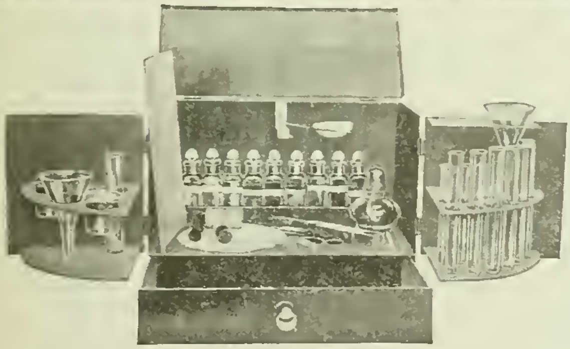

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Books Received

Bibliography on Radium. Its uses and results from its discovery up to January, 1922. Compiled by American Institute of Medicine for United States Radium Corporation, New York.

Radium. Abstracts of selected articles on Radium and Radium Therapy. Compiled by American Institute of Medicine for United States Radium Corporation, New York.

Opthalmoscopy, Retinoscopy and Refraction. By W. A. Fisher, M.D., F.A.C.S., with 248 illustrations, including 48 colored plates. Price $4.00. Published by W. A. Fisher, 31 North State Street, Chicago, Ill.

Endocrine Glands and the Sympathetic System. By P. Lereboullet and others. Translated by F. Raoul Mason, M. D., with the collaboration of Daniel R. Ayres, A.M., M.D. Price $6.00. Published by J. B. Lippincott Company, 201 Unity Building, Montreal, 1922.

Medicine. Analytical Reviews of General Medicine, 6th edition thoroughly revised. 12 mo of 525 pages, with 245 illustrations. Price $3.00. Published by W. B. Saunders Co., Philadelphia and London; J. F. Hartz Company, Toronto.

Medicine. Analytical Reviews of General Medicine. Neurology and Paediatrics. Volume 1, No. 1, edited by David L. Edsall, Harvard Medical School, and John Howland, Johns Hopkins Medical School. Published quarterly by Williams & Wilkins Company, Baltimore, U. S. A.

The Practical Medicine Series. Comprising eight volumes on the year's progress in medicine and surgery, under the editorial charge of Charles L. Mix, A.M., M.D. Each volume is complete on the subject of which it treats for the year prior to the time of publication. Volume 1 on General Medicine, price $3.50. Price of eight volumes, $18.00. Published by The Year Book Publishers, 304 Dearborn Street, Chicago, 1922.

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Charley Harris, in the printing business, got slightly peeved at a letterhead from a doctor who wanted bids on several thousand letterheads, different sizes, different grades and different colours, and wanted the printing form held standing. So, Charley took his typewriter in hand and wrote: "Am in the market for bids on one operation for appendicitis. One, two or five inch incision —with or without ether, also with or without nurse. If appendix is found to be sound, want quotations to include putting same back and cancelling order. If removed, successful bidder is expected to hold incision open for about sixty days, as I expect to be in the market for an operation for gall-stones at that time and want to save the extra cost of cutting."—*Kansas City Post.*

Extraordinary Development of the Tactile and Olfactory Senses—Thomas J. Williams, Chicago, discusses the case of Willetta Huggins, aged 17, who "smells" colors and "hears" with her finger tips. She has been wholly deaf seven years and completely blind for about two years.—*Jour. Am. Med. Ass.*, Oct. 4, 1922.

Milk-Borne Diphtheria—An epidemic of diphtheria in Austin, Texas, was investigated by Malcolm Graham and E. H. Golaz, Austin, Texas. Fifty-two cases of a total of seventy-one were traced to infected milk. More than 80 per cent. of the cases were in adults. The membrane was atypical, and the infection was unusually virulent. The source of the infection was traced to a milker who had a perforating ulcer of the septum, which was covered with a white, membranous deposit. Cultures gave a luxuriant growth of typical diphtheria bacilli, and the organism was powerful enough to kill a 350 gm. guinea pig in thirty-six hours. Another pig, injected but protected by antitoxin, had no ill effects. The perforation existed four years; it had been diagnosed syphilitic, and several treatments had been administered. The man had had difficulty at times for a year breathing through his nose, and would relieve himself by blowing violently to force from the nostrils a mass of whitish material. The authors urge that nose cultures should always be taken as well as throat cultures.—*Jour. Am. Med. Ass.*, Oct. 4, 1922.

Resuscitation by the Intracardiac Injection of Epinephrin—Julius Gottesman, New York, reports the case of a man, aged 73, with generalized arteriosclerosis, who developed severe pain in the right leg due to trophic changes. The pain continued to be very severe, and, September 20, amputation of the affected extremity under spinal anaesthesia was attempted. The injection of 10 c.c. of 1 per. cent. solution of procain into the spinal canal was followed almost immediately by drowsiness, cyanosis and shallow respiration. The heart action remained good for about five minutes, when the patient became unconscious, respiration ceased, and the pulse and the heart sounds could not be detected. Artificial respiration was begun and various cardiac stimulants, including caffein, camphor and epinephrin, were given hypodermically, but without effect; the breathing had ceased and the heart action seemed to have ceased. Twenty minims (1.2 c.c.) of epinephrin, full strength, was then injected into the left auricle by puncture of the chest wall between the left third and fourth ribs, the position in the cavity of the heart having been determined by aspiration of blood. There was immediate reappearance of the radial pulse and of feeble respiratory efforts. This was followed by the return of the heart sounds. The cyanosis was gradually replaced by normal color, and within a few minutes respiration became regular, the heart action good, and consciousness was restored. After this the patient made an uneventful recovery from his symptoms.—*Jour. Am. Med. Ass.*, Oct. 14, 1922.

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NEW ATTEMPTS TO PROCURE IMMUNITY TO MALIGNANT DISEASE IN MAN*

Prof. Sydney Russ, D. Sc. F.Inst. P.

Cancer Research Laboratories—The Middlesex Hospital, London

THE transmission of cancer by inoculation from one animal to another was first recorded by Hanau in 1889, and a few years later by Morau and other workers. More recently still the publication of Jensen's paper in 1903 on the subject of transmitted cancer attracted the attention of investigators in many countries, and directed special attention to the possibility of securing by this means some immunity to tumour growth. In these investigations it had been shown that a brief stage of immunity was acquired by animals after they had been inoculated by tumour material. This knowledge stimulated renewed efforts to find some method by which this temporary immunity could be made permanent and perhaps made possible in human beings, even to the extent of protecting them from the growth of their own malignant tumour cells. It was found, however, that living tumour tissue could not be used for this purpose as inoculations of it in spontaneously affected rats almost invariably produced fresh tumours. A further advance was made in 1908, when it was shown that the injection of blood corpuscles into mice, protected these animals against subsequent inoculations with carcinomatous cells, and for a time the possibility of using normal tissues as a means of producing immunity interested many workers. While it was recognized very soon that all tissues, especially those rich in cells, produced a limited degree of resistance to tumour growth when inoculated into animals of the same species, this immunity, however, proved very fleeting, reaching its maximum in ten to fourteen days, and then disappearing gradually and the protection was not increased by repeating the dose, nor did a larger dose intensify the effect. Many investigators then endeavoured to produce immunity by means of autolysed extracts or emulsions of the patient's own tumours, but no useful results were obtained. In 1910, however, Contamin recorded that he had obtained a condition of immunity in tumour bearing mice after treating the growths with x-rays, and stated that mice inoculated with this tumour material which had been exposed to x-rays in vitro, developed immunity to a subsequent inoculation of living tumour material. Excessive radiation, however, was found to destroy this immunizing power.

This line of research has been carried on at our Research Laboratories using Twort carcinoma. We found that mouse carcinoma exposed to a sufficient dose of radiation from radium, failed to grow when inoculated into normal mice. When this injection was followed by an inoculation of non-radiated tumour, most of the animals were found to be immune. The degree of the immunity depended upon the amount of radiation to which the tumour had been exposed. The immune state produced by the injection of irradiated tumour tissue is of much greater intensity than that caused by the inoculation of normal tissue, and is apparently permanent, and is not associated or dependent upon any tumour formation at the site of the injection. Experiments have been undertaken in the Middlesex Hospital, London, during the last two years to test the value of this method of inducing immunity in the hope that it might have some value in the treatment of human cancer.

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*Abstract of a lecture delivered before the Montreal Medico-Chirurgical Society, November 3rd, 1922.

The technique is as follows: A rat with definite malignant tumour is given an anaesthetic, and the growth is removed with antiseptic precaution. This growth is cut into pieces, minced with a Haaland mincer into a Petri dish and covered with a sterile sheet of mica. This is placed 30 c.ms. below the anticathode of a Coolidge tube running at an alternative spark gap of 5 c.ms. between spheres 5 c.ms. in diameter. The time of exposure depends upon the output of the bulb, and is checked every minute by the readings of an electroscope. As yet there is no international unit by which *x*-rays can be measured. During the course of this work we have employed the "rad" as our working unit; namely, the minimum dose of x-rays which under these conditions is needed to prevent the growth of Jensen's rat sarcoma when inoculated into normal rats. The electroscope should be standardized with a known quantity of radium, and the time required for an effective exposure to the x-rays to obtain the equivalent of a "rad," must be determined as the exposure goes on. The irradiated material is then inoculated into rats. A considerable degree of immunity has often followed the inoculation of quite small pieces. Quantities of this material, however, ranging from 0.003 to 0.2 cm. were inoculated into 80 rats. Fourteen days later all these animals and the controls received a test inoculation. It was found that the degree of immunity did not vary much, but the best result was obtained from the largest quantity, and therefore in subsequent tests that amount was used. Experiments were made to determine the rapidity with which immunity is produced, and from them it appeared that the maximum is reached fairly quickly, but the rats tested after eight weeks seemed perhaps a little more protected than those tested at shorter intervals.

It has been insisted upon by various writers, that it is comparatively easy to immunize an animal against the implantation of a graft, but difficult to affect an established tumour; in fact, up until now, no immunizing method has been found which will influence the growth of an established tumour. Experiments, however, undertaken by Ru[illegible], appeared to show a definite retarding effect on slow growing sarcoma, for, after an immunizing dose, the cancerous tumour was found to have grown only in five out of 32 animals which received the dose. These experimental results appear to confirm the work of previous investigators, and indicate that an immunity to tumour growth in animals can be induced by the inoculation of irradiated tumour cells. Two points appear to have been brought out strongly: First, that some degree of immunity may result from the adequate irradiation of a malignant tumour in the body, but to ensure this in practice is a matter of great technical difficulty. The second point is that the treatment of a patient with irradiated tumour cells, after the surgical removal of the growth may help to set up a state of resistance to the disease. To test the value of the second statement, attempts have been made during the past year in thirty cases to immunize patients suffering from cancer, against their own tumour cells. The time that has elapsed is too short to form a decided opinion on the value of this treatment on the progress of the disease. All that we can say at present is that with efficient technical precautions the treatment can be carried out without causing any tumour formation or serious effects. The cases treated were those in which the disease was at such a stage that complete surgical removal was not considered possible, but was not so far advanced as to preclude a prospect of life for some months. Of these patients, five were suffering from carcinoma of the breast, diagnosed by microscopic examination. In these a limited operation was performed, the primary growth only being removed, and the axillary glands left. When last seen in January, 1922, these patients were all in good health without evidence of recurrence. In some of the cases the disease had been very advanced. In reviewing these results it must be borne in mind that in almost all the cases the stage of the disease rendered any other form of treatment inadvisable. The technique was as follows: At the operation only as much tumour was removed as was sufficient to provide material for the subsequent injection. In breast cases total removal of the breast appeared more simple than a partial removal. In cases where glands were involved no attempt was made to remove all the growth. After the removal of as much of the tumour as was deemed advisable the wound was closed and dressed. Two pockets were then prepared in the abdominal wall on either side of the mid line in the following manner: An incision about an inch long is made down to the deep fascia and a strong pair of sinus forceps is thrust along between the subcutaneous tissue and muscles and then opened out. The pockets thus formed are fan shaped, with the narrow end upwards, so that injected material tends to be retained. They are purposely made large in order to increase the area of contact between the patient's tissues and the injected material. A large sized drainage tube is put into each of the openings, reaching nearly to the bottom of the pocket, and stitches are inserted into the skin, so that the wounds can be easily closed afterwards. The whole of the growth removed at the operation is sent to the laboratory in a sterile dish, where it is cut up with scissors and the growth separated as far as possible from the normal tissue. It is then placed in a metal mincing machine, covered with a sterile towel, and minced into the middle of a shallow dish. The layer should be of uniform thickness in the bottom of the dish. It is then covered with a sheet of mica, put into a slightly larger and deeper dish, and wrapped in a sterile towel to protect from possible contamination during the *x*-ray exposure. After the radiation dose of two "rads," the minced tumour is sucked into a long glass syringe fitted with a wide aperture and canula, and returned to the ward. The preparation of the material as a rule takes about two hours. In the ward the dressings are removed from the abdominal wound, and equal quantities of the radiated material injected through each drainage tube. These are then withdrawn, the ligatures tied, and the wounds sealed with gauze and collodion. This can often be done before the patient has completely recovered consciousness, but in any case the proceeding may be made almost painless. The quantity of material injected has varied from 4 to 15 c.m.; in most cases it is over 8 c.m. Any addition of antiseptics to the irradiated material weakens its immunizing powers and tumour tissue infected with septic organisms is liable to produce an abscess at the site of injection and have no immunizing action. The dose of radiation appears to have practically no bactericidal action.

It is also to be remembered that in introducing this material into patients we are inserting tumour cells into the most susceptible of all individuals and are trusting entirely to the radiation to prevent these cells growing. We feel it essential in a treatment of this kind that a rigorous x-ray technique be adopted. Our method is to run the Coolidge tube as far as possible under similar conditions of spark gap and heating filament current. Directly the exposure of the minced tumour has begun measurement of the x-rays issuing from the bulb are taken by means of a gold leaf electroscope which has previously been standardised by means of a known quantity of radium.

The final result which it is hoped by this method to obtain is that the patient will be able to destroy all tumour cells left in the body after the limited operation. In connection with this method Dr. Sidney Russ writes to the editor as follows: The foundation of the process rests upon an experimental basis which has been carried out in the transplantable tumours of the mouse and rat. The first step was the determination of the lethal dose of radiation (x-rays or radium) for such tumours; namely, the amount of radiation required to prevent any proliferation of the tumour cells. Animals given an inoculation of such irradiated tumour tissue are in a majority of cases made immune by this method; and, this immunity is of a lasting character, in contrast to that which is obtained by other measures. The immunity process applied to human beings consists in the removal of the tumour mass by surgical means and its re-introduction into the body of the patient after it has been given twice the lethal dose of radiation; an amount which in human cases has been shown to be sufficient to prevent any growth of the re-introduced tissue. An essential point of the process is the recognition by those undertaking it, that it is team work in which the surgeon, the pathologist, and the radiologist are responsible for different parts in it. A difficulty at present exists in specifying the exact dosage of radiation, a difficulty which it is hoped may be overcome in the near future by the introduction of an international unit of x-ray intensity, so that institutions may have a suitable standard of reference.

RECENT ADVANCES IN X-RAY TREATMENT*

Edward Reginald Morton, M.D., C.M. (Trin. Tor.), F.R.C.S., Ed.

Lecturer on Radiology, University of Cambridge, and West London Post Graduate College

THE outstanding feature of the subject of medical radiology is the almost dramatic suddenness with which it came upon us and secured for itself a permanent position of the first importance. It is just 27 years since the x-ray was discovered, and we need go no further than its application in diagnosis to see what a boon it has been to humanity. While it is being constantly improved in detail, this branch of radiology has been pretty well worked out for some years past; that is, in its broad principles; but think of the wealth of accurate knowledge we have gained with its help. Instance, with the war fresh in our minds, the localization of foreign bodies; the investigation of fractures; the certainty of an accurate diagnosis in these as well as in such conditions as aneurysm of the thoracic aorta, oesophageal stricture, hour-glass stomach, the urinary calculus. Remember also what it has taught us of the anatomy and physiology of the stomach. These are but a few of the many examples that might be given.

Concurrently another application of the x-ray was being developed; as soon as it was known that it had the property of setting up a reaction in living tissues, efforts were made to use it as a therapeutic agent. Progress was much less rapid than in diagnosis, and for a long time results were not impressive; in consequence many radiologists abandoned this side of our work, but some of us held on in spite of the difficulties and discouragements encountered. A relation of these difficulties, and a history of the progress of x-ray therapeutics might be interesting, but not very useful. I would rather spend the limited time at my disposal in helping you to appreciate the present position and future possibilities of what promises to be a matter of the highest importance to the public and our profession. First, let us consider the changes that take place in living tissue cells after exposure to an adequate dose of x rays. Under the microscope we see the nuclei disintegrating with vacuolation of the cell contents. Ultimately the whole cell breaks down, is dissolved and carried away by the lymphatics. At the present moment the theory is that the rays split up the radiosensitive chromatin of the nuclei, bringing about the formation of a toxin or ferment which in proportion to the x-ray dosage, either stimulates, inhibits, or destroys. We may take this as the first principle underlying x-ray therapeutics. The second is that the more embryonic the type of cell the more susceptible is it to these changes. Thirdly, the most susceptible period in the life history of any cell is when undergoing division. Such changes are of course fundamental, and any cell or mass of cells, subjected to this treatment becomes profoundly altered. The alteration is not immediate, but extends over several days, and meanwhile "things are happening" in the surrounding normal tissues. The growth, formerly active and invading and lowering the local and general resistance of the organism by means of toxins, now becomes to all intents and purposes, a more or less inert foreign body. Owing to their higher resistance and vitality, normal tissue elements are strongly stimulated, there is a determination of blood to the part, with an active leucocytosis, and severely damaged cells are finally disposed of. There are other matters I might refer to in this connection, but this is enough for our present purpose. Applying these principles we are able to formulate the conditions that make for success in the treatment of malignant disease. The chief one is that the growth is attacked in a relatively early stage, while still localized so that every part of it receives the proper x-ray dose. Secondly, it is necessary that the general health of the patient has not been seriously impaired, since we depend on normal vital processes to complete the changes we have initiated. It will be evident that we cannot expect efficient reaction in an area that has been the site of a more or less extensive surgical procedure.

As already mentioned, progress in the therapeutic application of the x-rays has been very slow, chiefly for want of accurate knowledge on many points of the highest importance. Even now it is not fully realized among radiologists that the type of ray necessary to give the best results in diagnosis differs widely from that required for therapeutic purposes. It is impossible to get satisfactory results in treatment with apparatus primarily designed for diagnosis, and vice versa. There is still a demand for equipment adaptable for both purposes, and this has done much to delay therapeutics since the only tests applied were of a diagnostic kind. X-ray therapeutics remained in an almost stationary condition until the construction of x-ray apparatus. We may here consider a few important physical principles involved in this question, and I would first take secondary radiation. It is the property of the x-ray when it falls on any substance to give rise to a secondary radiation from the latter. The character of this secondary radiation depends on the wave length of the primary beam itself, and the atomic weight of the elements making up the substance it falls on. The more highly penetrating the radiation the shorter is the wave length, and the more profuse is the secondary radiation. In diagnosis we want rays of low penetration so as to give good shadows, and as few secondary rays as possible which tend to blur outlines and generally fog and spoil the image. In treatment we want all the radiation we can get, especially in the deeper parts, and we do not care whether it is primary or secondary so long as we get enough. In diagnosis the primary rays from the x-ray tube are all we want, and secondary rays are a nuisance; in treatment the chief function of the primary ray is to set up a profuse secondary radiation, which, so far as the result is concerned, may be more important than the primary beam itself; the more highly penetrating (or shorter the wave-length is) the less will be lost by absorption in traversing the upper layers of tissue.

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*Read at the meeting of the Montreal Medico-Chirurgical Society, Oct. 6th, 1922

In illustration of what I mean, let us imagine a huge water tank supported in such a way that we can get underneath the middle of it. A large glass bell-jar has been fitted into the floor of the tank so that we can stand in the cavity of the jar and be surrounded by the water. Let there also be a light-tight cover to the tank with an adjustable diaphragm in the centre, and immediately over this again an electric lamp. By suitable controls we can vary the size of the diaphragm opening and the intensity of the light from the lamp.

First let us see what happens with the long wave-lengths used in diagnosis, to represent which we will make the lamp glow at a bright red. As we open the diaphragm and assuming a sufficient depth of water above, we shall see the lamp filament very faintly at first and without sensible illumination of the cavity in which we are standing. As the opening enlarges, the lamp filament becomes less distinct but there will be more illumination where we stand. We get no more direct illumination from the lamp into our glass cell; the extra illumination arises from the secondary radiation of the larger amount of water illuminated, and this will increase until the periphery of the illuminated cone has been extended so far that the secondary radiation can no longer reach us, but is entirely absorbed by the intervening thickness of water. At this stage the light will seem to come from nowhere in particular and be very feeble at the best.

Now let us begin again, this time turning on the lamp to the fullest brilliance it can bear. The moment the diaphragm is opened our cell will be illuminated by direct rays from the lamp, and this *direct* illumination will increase until the cone of light just encloses our cell. Up to this point such secondary rays as are set up in the upper layers of water may be neglected. While no more direct rays can reach our cell by opening the diaphragm still further the illumination around us steadily increases from the secondary radiation and will continue to do so as long as it is able to overcome the absorption of the intervening thickness of water.

Probably the physicist will say I am wrong in speaking of secondary radiation in this connection and that it is all due to reflection. Fortunately for our present purpose it does not matter which it really is; it serves to explain what I mean. Assuming that we are using the x-rays instead of ordinary visible light, the conditions in the above experiment are exactly similar to those present when treating a deeply seated growth, such as a carcinoma of the uterus, pancreas, oesophagus, &c., and my object in describing this imaginary experiment is to emphasize the wide difference in the conditions necessary for success in x-ray diagnosis and x-ray treatment, and that if one set of apparatus is used for both, satisfactory results cannot be hoped for.

The rays coming from an x-ray tube is a

composite mixture of various wave-lengths, just as ordinary daylight is a mixture of different colours. The higher the resistance of the tube and the higher the voltage used to excite it the greater is the proportion of short wave-lengths. As we do not want the longer waves, since they are so readily absorbed by the skin and set up dermatitis, we stop them by placing a sheet of metal between the tube and the patient. Twelve mm of Al or ½mm of zinc are now commonly used and with voltages of about 200,000 the resultant beam is practically homogenous. The tendency is to use higher voltages to get shorter wave-lengths, and I expect to be working with about 500,000 volts before many months are past. The great difficulty in x-ray therapeutics is that of getting even irradiation through every part of the diseased area. Surface lesions are difficult owing to surface irregularities. Central lesions are almost as difficult owing to the loss in the overlying tissues, but the dose can be built up by irradiating from different angles. We have a standard to work to, which we call the Unit Skin Dose; subject to certain conditions and requirements we can give this dose at will, and when administered to normal skin it gives rise to a slight hyperaemia in about six days followed by tanning in about a month. No permanent injury is done and after a suitable interval it may be repeated on the same area. In treating a central lesion we place the centre of the tube 23cm from the skin, and we may suppose the depth to be 10cm. If we represent our skin dose by 100 it will be found that only about 20% reaches that depth, which is too small for any practical use. As a cancer requires at least 110% we must give at least five more such doses from different angles but all directed to the same centre. Superficial lesions require different technique, and while so far results have been less favourable, they promise in time to be equally good with the improved methods now being worked out.

It will now be profitable to consider the effect of varying x ray doses on malignant cells, especially carcinoma. In the first place we may say that small doses more or less frequently repeated have an inhibitory influence, so long as the cumulative effect at any period does not exceed a certain amount. If this limit is exceeded the case ceases to improve and if the dose is pushed still further it may get rapidly worse. Consequently we have a stimulating dose for cancer cells, which is about 40% of the unit skin dose standard, and one which *must* be avoided. Treatment should always be completed at one sitting and every care taken that no part of the lesion receives less than the full dose. If we give a cancer cell more than 40%, the lower limit of the stimulating dose, the result is stronger stimulation at first and then over-stimulation as the dose approaches 60% of the U.S.D. This latter is the lower limit of what we may call the paralysing dose, which extends on to 90%. Cells subjected to a dose within these limits will lie dormant for a period that is longer as the dose approaches the upper limit. They are not destroyed and will revive in time. Pushing the dose to the U.S.D. or 100%—only stimulating to normal epithelium—we enter what is the lethal dose for cancer cells, but we must aim at giving not less than 110% to every part of the lesion and we go to 120% without fear. Sarcomatous cells require but 80% of the U.S.D. but results are not appreciably better on this account owing to the readiness of this type to undergo early dissemination. Localized tuberculous lesions not complicated by sepsis, such as the bones and joints of children respond very favourably to 50% doses, but must be repeated at suitable intervals. The primary function of the ovary is suspended by a 35% dose permanently, and this dose has been successful in excessive bleeding at the menopause with or without the presence of fibroids; the latter usually shrink and cease to give further trouble.

It is difficult to avoid technicalities in such a highly technical subject as radiology, but I wish to give some idea of where we are. Treatment by the x-rays is no longer the empirical, even haphazard procedure it was but a few years since. We can now produce a definite type of radiation at will and administer it with reasonable accuracy; we know now what we want to give, and how to give it; further, it can be given to any part of the body, even to places where the surgeon cannot or dare not go. More than this, in the gynaecological clinic at Erlangen in Bavaria where the main part of this work has been elaborated, surgical methods have been definitely abandoned for some years past in cases of malignant disease of the female pelvis, and with greatly improved results. I have caused tumours of the breast, diagnosed as cancer by competent authorities, to disappear within a few weeks. I have treated many cases of cancer of the rectum who are now getting along comfortably, improving in health, gaining weight, and enjoying life to a degree that is not lessened because the proposed colotomy has been indefinitely postponed. Cases of definitely proved cancer of the tongue, tonsil, and larynx, have become free from all signs of malignancy; I have now under my care a case of cancer of the oesphagus, in which a gastrostomy was done in March of last year to avoid death from starvation. Three weeks after his first x-ray treatment food began to pass down the normal way, and within three months he could put away an ordinary meal as well as ever before. He has now regained the 60 odd pounds he lost, looks fit and well and wants to go to work. This is not the only case of the kind that is doing well as a result of treatment by modern x-ray methods under my own care. Several cases of definite recurrence following removal of the breast have cleared up in a most satisfactory way, but a larger number have come too late to hope for any definite improvement. Far too many cases of every kind come to us at a stage when no conceivable method can even attempt to cure, and many have to be turned away. It is not only useless, but unjustifiable to attempt serious x-ray treatment where there is dissemination, or even wide local extension and where there is cachexia, or even marked anaemia. These full irradiations cause a fall in the red blood cells which the anaemic patient cannot afford, apart from the fact that the vital processes are too feeble to deal with the problem to be solved. A preliminary blood-count should be done always, and if the reds are more down 10% down it is wise to delay treatment, and put the patient on intramuscular injections of iron and arsenic, generous feeding &c. for a fortnight or more until the blood becomes more normal. This procedure ment, so as to replace as quickly as possible what has been lost by the irradiation. It is of should be carried out in *all* cases after treat- lowing treatment. This destruction of some of the red blood cells is the only constitutional effect of any importance, and beyond a sense of fatigue lasting from 12 to 36 hours, the normal life of a patient in good bodily condition is scarcely interfered with.

SOME PHASES OF THYROID DISEASE*

Neil John MacLean, M.D., F.A.C.S.

Winnipeg

DISEASES of the thyroid are of great interest to the medical profession. They are of interest to the biochemist, the physiologist, and the research worker. They are of special interest to the general practitioner, the internist, and the surgeon. I doubt if there is another subject in the realm of medicine with such diversity of interests. Medicine is becoming more and more co-operative, and in the care of patients, I know of no other condition where co-operation between the different departments of medicine is more essential.

The early investigations of the function of the thyroid were carried on mainly by extirpation of the gland. In 1856, Schiff removed the whole thyroid and noted the result. At this time the parathyroids were unknown. Since then, a great deal of experimental work has been done. Sandström, in 1880, discovered the parathyroids in the higher animals. Without reviewing this work, it may be said that the removal of the thyroid causes myxoedema, while removal of the parathyroids is followed by tetany. Removal of the whole thyro-parathyroid apparatus is usually followed by death in two to three weeks. In 1896, Baumann isolated a substance, which he designated thyro-iodin. In 1914, Kendall isolated in pure crystalline form the active principle of the gland, and gave it the name,—thyroxin. This substance when administered has the same physiological action as the thyroid gland itself.

The function of the thyroid is, therefore, the elaboration and control of this iodine-containing hormone, thyroxin; this in turn is essential to normal metabolism. Thyroxin has the chemical formula of $C_{11}H_{10}O_3NI_3$ thyro-oxy-indol. The total thyroxin content of the body is about 25 mgms. approximately one-third being in the thyroid, and not more than 2 mgms. in the circulating blood. Plummer, who has made a great many clinical observations on the action of thyroxin, has shown that "2 mgms. administered daily may hold the basal metabolism 20 to 30 above normal, while 3 mgms. may hold the basal metabolism 50 above normal. Fifteen mgms. given intravenously to patients suffering from exophthalmic goitre, who have a basal metabolism plus 65 may not cause any notable reaction. When given to patients having large colloid goitre with bruit, the bruit disappears, and the thyroid shrinks rapidly, but constitutional reaction may be absent. With these two exceptions a sustained elevation of the basal metabolism has followed every intravenous dose of more than one mgm. of thyroxin." Following the administration of a medicinal dose of thyroxin to a myxoedematous patient, the maximum effect is not reached till the tenth day, this effect is maintained for ten days, and then gradually passes off, so that by the end of the eighth week, the patient has returned to his original status.

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The discovery of thyroxin has been one of the greatest advances in the study of thyroid function. However, the whole problem is by no means solved. We do not know whether internal secretions perform their functions by supplying a substance, which the tissues require, or whether they have an added function of acting as an antitoxin, thereby destroying poisonous products within the fluids and tissues of the body. The work of Marine and McCarrison on contaminated waters as causative of goitre, would seem to support the latter hypothesis.

Pathology.—Apart from tumour formation and inflammatory conditions there are two essential changes that take place in the thyroid, namely: hypertrophy and hyperplasia. Hypertrophy may be physiological as occurs during pregnancy, or the first stages of endemic goitre, in the latter true hyperplasia being also found. This hypertrophy is due to stimulation, and if the stimulation persists over a long period of time, the changes in the gland may pass into a condition of permanency, and thus become pathological.

In hypertrophy there is an increase in the normal number of vesicles, and in their colloid content, so that as the condition progresses, we have eventually the picture of typical colloid goitre,—namely, vesicles lined with cells, which would appear to be flattened from pressure from the greatly increased amount of colloid, but with no increase in the cellular element. The condition of the gland on section is characteristic, both macroscopically and microscopically. Hyperplasia gives an entirely opposite picture. The cellular elements predominate. The vesicles are lined with one or more layers of cells, which have become columnar in type, and the walls of which are thrown into folds. There is no colloid to be seen, either with the naked eye or microscope. The gross section has a beefy appearance and resembles very much a section of pancreas. Wilson says that, "the cells lining the vesicles of the normal thyroid never number more than fifty in microscopic cross section, while in exophthalmic goitre where a condition of hyperplasia exists, seventy or more cells may be counted in one follicle." Adenoma develops from the embryonic cell rests between the vesicles or from the vesicle of the adult gland. They are known respectively as foetal and adult adenomata. They may be single or multiple. The surrounding gland structure may show areas of hyperplasia, resembling that of exophthalmic goitre. This is the pathological condition usually found in toxic adenomata. An adenoma through degenerative change or haemorrhage into its substance, may become cystic, hence the source of cysts of the thyroid. Carcinoma occurs with much greater frequency in the thyroid than sarcoma, the proportion being in round figures as ten to one, (Wilson, L. B., *Annals Surgery*, 1921, 74, 129). Ewing (*Neoplastic Diseases*, page 885) states, "notwithstanding the wide acceptance of numerous reported cases as sarcoma of the thyroid, there is strong reason for believing that the great majority of these tumours are of epithelial origin." When, however, sarcoma develops in the thyroid it must necessarily have its origin in the fibrous stroma, the cells of which are of mesodermic origin. Inflammations may be acute or chronic. They are, however, rare. The acute inflammatory conditions are usually associated with the acute infectious diseases notably scarlet fever and typhoid. In the former, fibrosis with consequent hypo-function of the gland is prone to follow. In the latter abscess formation is not uncommon. An infective type of thyroiditis is said to be endemic in Brazil. The chronic inflammatory conditions, tubercle tuberculosis, syphilis, and actinomycosis are very rare. Tuberculous thyroiditis occurs either in miliary or nodular form. Syphilitic lesions of both congenital and acquired types are described. The acute inflammatory conditions require to be differentiated from toxic goitre and the chronic types from malignant disease.

Etiology and Distribution of Goitre. Goitre is very widely distributed geographically; in fact it may be said to be a universal disease. In many places it is endemic, while in others it is extremely rare. That it is less prevalent in districts near the sea, and more prevalent in inland regions, has been known for a long time. It reaches its highest incidence in countries where snow-capped mountains abound. In Northern India, Switzerland, in British Columbia, and the Western States as well as in Alaska it is endemic. In these places the drinking water is very prone to be devoid of iodine. The water in mountainous districts may be said to be almost pure distilled water; its source being the melted snow from the mountain tops. It might be noted that in the mountainous districts of Norway and Scotland, goitre is not common. Here the mountains are not perpetually covered with snow.

Goitre is said to be so common in certain parts of the Dominion, that 60% of the population show noticeable enlargement of the thyroid. As many of these goitres remain permanently enlarged, and as not a few develop adenomata through the abnormal stimulation of "cell rests" the importance of prevention and treatment is obvious. It is quite possible that the prevention of endemic goitre may at the same time, to a great extent, be the prevention of adenomata. Adenomatous nodules shrink under the administration of iodine or thyroxin in the same way that a diffuse colloid diminishes with the same treatment. At the present time there are two theories, as to the cause of endemic goitre, namely: the infectious, and the iodine-deficiency theory. Much experimental work has been done, the results of which would seem to lend support to the former theory, especially in recent years by McCarrison. At the present time the iodine deficiency theory seemtto be the most popular. While many interestins facts could be stated in support of the former, the geographical distribution of goitre strongly favours the latter. No doubt both of these factors, as well as others play a part in the etiology. The work of Marine and Kimball in the treatment of school children in a goitrous district in Ohio with sodium iodide is most interesting and important. Less than one-quarter of one per cent. developed enlarged thyroid after treatment, while twenty-seven per cent. of those who received no treatment, showed enlargement at a subsequent examination. This result seems to emphasize the importance of preventive medicine in this condition.

As far back as the twelfth century an Italian physician advocated seaweed as a treatment for goitrous patients. In Japan and along the Atlantic coast where seaweed is extensively used as a diet, goitre is very rare. Cameron, of the University of Manitoba, has drawn attention to the power of certain plants to concentrate iodine, notably seaweed. Formerly salt was obtained from sea water by evaporation. It was then found to contain large numbers of bacteria. If the bacteria were eliminated sea salt would be preferable, and would, no doubt, contain the requisite amount of iodine. Sodium iodide may be conveniently added to table salt. Our table salt is so purified, that if it formerly contained iodine, this has been entirely eliminated in the manufacturing process. We are becoming so civilized that we eliminate iodine from our salt and vitamines from our food.

Goitre is found throughout the animal kingdom from fishes to man. It is much more common in animals living under domestic conditions than in those living in the wild state. In districts where goitre is endemic, the lower animals are also affected. In Switzerland, 30% of the dogs are said to have goitre, and Marine states that he found the gland abnormal in 90% of the dogs brought to his laboratory in Cleveland, a district where goitre is very prevalent. It is said that sheep raising in Michigan was unsuccessful on account of goitre, until salt, containing iodine as an impurity was used. In 1915 on a farm fourteen miles from Winnipeg, an epidemic of exophthalmic goitre occurred among the lambs. In a herd of 400 sheep, the ewes themselves were apparently normal, but seventy per cent. of the lambs were born in a very weakened condition, and with the symptoms of exophthalmic goitre. Some were able to raise themselves on their front legs, but could not use their hind legs. The majority of those that were able to nurse, or were held up while they nursed, recovered. Fifty per cent., however, died. The thyroid which was removed and examined microscopically, showed true Graves' disease. I do not know of any parallel to this in the human species. A veterinary surgeon said that the administration of iodine to the ewes would have prevented this condition.

The "hairless pig disease" which is common east of the Rocky Mountains from Alberta to Utah, is said to be a form of hypo-thyroidism.

Clinical Manifestations. An infant born with a functionless thyroid is a cretin. In districts where goitre is endemic, cretinism is quite prevalent. It varies directly with the extent in which the disease prevails amongst the adult population. Defective thyroid function in the mother is the essential causative factor in cretinism. Paracelsus in the early part of the sixteenth century made the first positive statements about cretinism, and its relation to endemic goitre.

In the adult various grades of sub-function of the thyroid are frequently met with. Some time ago, the case of a young woman sixteen years of age came under my observation. She was very obese, mentally sluggish and suffered from drowsiness. This patient became entirely well on a course of thyroid extract. A basal metabolism was not done at this time.

Myxœdema does not occur until the basal metabolism has fallen considerably below normal, so that many cases of hypothyroidism are probably overlooked, that have not reached the myxœdematous stage. Cretins and myxœdematous patients respond rapidly to the administration of thyroid extract or to the intravenous injections of thyroxin.

Considerable confusion has prevailed between the types—toxic goitre and exophthalmic goitre or true Graves' disease. The difference has been recognized for some time, toxic goitre being known as false exophthalmic, (Berry), Pseudo-Graves' disease, Basedowized Goitre, etc. In toxic cases, the patient has had for some time an enlarged thyroid, which has not caused constitutional symptoms. This may have been an adenoma, single or multiple, or an enlargement of the diffuse colloid type. Symptoms of increased activity develop. This occurs on an average in from ten to fifteen years, after the first appearance of the goitre. In Graves' disease on the other hand, the goitre usually appears simultaneously with the constitutional symptoms. There are variations to this rule, however, where the goitre has appeared shortly before or several months subsequent to the development of symptoms. In toxic goitre, exophthalmos is usually absent, and if present is so in a very less marked degree. The cardio-vascular symptoms are more pronounced, while in Graves' disease the nervous symptoms predominate. The stages of remissions and exacerbations are shorter and more pronounced in toxic than in exophthalmic goitre. The gland is, as a rule, smaller and uniformly enlarged in Graves' disease, while in the toxic goitre it is nodular and usually asymmetrical. The basal metabolic rate is plus in both cases, but as a rule higher in Graves' disease. The pathological differences have already been briefly discussed. Toxic adenoma appears to be a true hyperthyroidism, the symptoms being the same as those produced by the administration of thyroid gland, or the intravenous injection of thyroxin. Exophthalmic goitre is either a disthyroidism, or some other hormone, in excess of normal, has been added to that of the thyroid.

Surgical Treatment. In discussing the surgical treatment of goitre, it will be necessary to deal with the different types separately, for even though the etiology and pathology are confused, the treatment is more clearly defined.

1. *Endemic Goitre* is essentially a medical condition in the early stages. This is true of every diffuse non-toxic enlargement of the thyroid, occurring either endemically or sporadically. They become surgical only under the following circumstances: *Age and duration:* Cases occurring during adolescence frequently subside. Undoubtedly a larger percentage would return to normal with active medical treatment. This enlargement being a physiological response on the part of the thyroid to a stimulus, it is clear that x-ray treatment would be decidedly harmful. One cannot speak dogmatically about the time at which operation should be undertaken, as so many factors must be considered. However, a goitre that has persisted over a number of years is very likely to be permanent and surgery should be considered. *Pressure:* Dyspnoea is the main pressure manifestation. The cartilaginous rings of the trachea may be actually absorbed, the trachea being converted into a narrow flattened tube, the so-called "scabbard trachea". An adenoma of one lobe may give considerable lateral distortion, while a tumour of the isthmus may cause the most marked symptoms from direct antero-posterior pressure. Such conditions are positive indications for surgical treatment. *Deformity:* Operation should be seldom advised purely for cosmetic reasons. Other associated symptoms and the large percentage that later become toxic, may justify operation. Toxic manifestations appear in about twenty-three per cent. of simple goitres. This eventuality must be considered in all enlargements of the thyroid that have reached the stage of permanency.

2. *Toxic Goitre* or toxic adenoma should al-

ways be considered a surgical condition. The time at which operation should be undertaken, however, is very important. Apart from this, the other indications and operative technique are practically the same as simple goitre, with the exception that operation becomes more imperative. The time at which to operate is during the period of remission, and not during the stage of exacerbation of symptoms. These cases are dangerous surgical risks, if operated on during the stage of acute toxicity. They require time, rest, and the same pre-operative care as in exophthalmic goitre. Ligation of arteries in these cases is practically of no value, and should not be done. Removal of the adenoma is followed by complete relief from all symptoms in about three weeks. Diffuse colloid goitre with toxic symptoms calls for bilateral resection similar to that in simple goitre, with the exception that less gland need be conserved.

3. *In exophthalmic goitre* several questions arise, first, are the results of surgery entirely satisfactory? second, is the operative mortality so high as to make surgery unjustifiable? and third, is there any known treatment by which surgery can be supplanted? In answer to the first question, "Are the results of surgery satisfactory from the standpoint of cure?" I believe that provided gross organic changes have not taken place in the heart and other organs, a removal of sufficient amount of gland will be followed by cure in about eighty to ninety per cent. of cases. There is a small percentage of cases, while they are free from severe relapses, are not entirely well. A smaller percentage, while much improved from their former condition seem to be very far from normal. Their basal metabolism may be low, but they suffer from palpitation, tire easily, and have not their normal capacity for work. Some of the unsatisfactory results are due to the unnecessary delay in deciding whether the case can be cured medically or should receive the benefits of surgery. I do not wish to confuse this with the delay which is essential to tide a patient over an acute stage of toxaemia before operation is considered. Another very important factor, in contributing to unsatisfactory results is inadequate or incomplete operation. The surgeon may consider that he is doing the safest thing for his patient by removing or resecting one lobe of the gland at one time. It may or may not be his intention to deal with the opposite lobe in a similar manner later. Such a case may subsequently develop symptoms similar to those preceding the operation. McCarrison records such a case, and I have recently removed three-fourths of a remaining lobe in a patient with return of symptoms four years after the primary hemithyroidectomy. It should be remembered that to a certain extent, the organic changes in the heart and other organs are permanent, and will not be cured by treatment directed solely towards the gland. Ligation of arteries should be considered only as preliminary to operation on the gland itself. My own personal belief is that they are unnecessary, as improvement in toxicity can be obtained equally well by time and rest. Furthermore, as ligations are usually undertaken when the patient is highly toxic, they have contributed considerably to the surgical mortality. The question as to the amount of gland to be conserved arises. In the research work at the University of Minnesota, it was found that while one-third of the gland was necessary for the growing animal, one-sixth was necessary after growth had ceased. Under the direction of Professor Swale Vincent and myself, Dr. Adamson carried out a number of experiments at the University of Manitoba, and he found that dogs apparently remained well, with even less than one-sixth of the gland, and in one animal in which only one parathyroid was conserved of the whole thyro-parathyroid apparatus, the animal showed no symptoms. It should be remembered that different types of animals react differently to removal of the thyroid, depending upon whether they belong to the herbivora, or carnivora. These experimental differences as shown by Gley, of Paris, are due to the anatomical relationship between the thyroid and the parathyroids. For example,— in the rabbit the external parathyroids are often detached from the thyroid and would thus escape removal in the operation. Exophthalmic goitre cases seem to require a very small amount of gland. Our custom has been to conserve one-sixth of each lobe, probably a little more in mild cases, and somewhat less in severe ones. The operation however, may be carried out in one or two stages. As these cases do well with this small amount of gland, it is quite obvious that a single lobectomy may be followed by incomplete cure.

I have recently written to all toxic and exophthalmic goitre cases and the reports received have been highly satisfactory with the exceptions of two. These two were able to be about, but were not in a condition to do continuous work. The basal metabolism in one of these cases was found to be plus eight, while in the second case a basal metabolism could not be done, but she wrote complaining of general weakness and incapacity for work.

Second:—Is the operative mortality in exophthalmic goitre so high as to discourage surgery? There are some internists, who are so extreme as to absolutely exclude surgery from their methods of treatment. On the other hand there are some surgeons, who are in so much haste, that they advocate operation in every case on diagnosis. These extreme views no doubt contribute largely to the operative mortality, the former because some of the cases will eventually seek relief through surgery when in a very extreme condition, and the latter through precipitate operating when the patient is in an acutely toxic and dangerous stage. In an article, which I published three years ago, I made the statement that exophthalmic and toxic goitres should never be considered surgical emergencies. Further experience has served to fully convince me of the truth of this statement. I wish to emphasize strongly the necessity for pre-operative care and preparation of these patients. Some when first seen may be past the acutely toxic stage. The majority are, however, especially when seen by the family physician in a highly toxic condition. They frequently have a pulse rate of 120 to 140. The basal metabolism is often above fifty, and may be plus seventy-five or over. Patients while in this stage are medical and not surgical cases. They should be put to bed with absolute mental and physical rest; the diet should be free from proteins, particularly those containing tryptophane. Zeine and gelatine, which contain practically no tryptophane radical are allowable (Cameron, A. T., *Can. Med. Ass. Jour.* April, 1922) Invariably we have seen that after a time, usually a matter of several months, their pulse rate drops to below 100, the cardiac dilatation is markedly improved, and the basal metabolism is below plus forty. If these patients are allowed to gradually get about, their strength returns, and in time they can take walks without undue fatigue. To accomplish this, has taken in some cases, from two to three months, in others from six to nine months. Much will depend upon the length of time the patient has been ill before coming under observation. When this result has been obtained, we find that these patients will, as a rule, stand a complete bilateral resection of the gland at one sitting.

Formerly, when I did ligations more frequently than I do at the present time, I had a patient who was being treated by rest, and by intraglandular injections of boiling water, as advocated by Miles Porter. There was always a marked reaction after each injection. Finally I decided to do a ligation. When she was taken into the operating room, her pulse rate increased from 120 to 180 per minute. I thought the risk would be unwarranted and sent her home for three months rest. She did not return until nine months had passed. Her general condition had very much improved, her pulse rate being below 100. I did a bilateral resection at one sitting, following which she made a very normal recovery. I have had several reports from this patient. She has since been in good health, and has performed the routine housework on the farm, as well as given birth to a child. This case further impressed me with the importance of the time element in deciding when to operate.

Several years ago two of my exophthalmic cases died following operation, and one died following an injection of boiling water into the gland. I feel that, had I allowed these patients further time, so that they would have been not only over, but well away from the acutely toxic stage, they might have recovered. The case in which boiling water was injected was an extreme one. She had three months rest in bed, and expert medical care, but was still very toxic. I believe that had the surgical treatment in this case been postponed for several more months, her resistance would have been materially increased by this time, and a less unfortunate outcome obtained. In two other cases in which I strongly advocated prolonged rest before considering surgery, both these patients were operated on by other experienced operators and both died. Another patient, a prominent member of our legislature, for whom we had prescribed three months rest, preliminary to operation, was operated on elsewhere without preliminary treatment, with a fatal result.

While the element of rest is very important, I believe that the time element to be even more so. The waves of remissions and exacerbations probably extend over twelve months, though this is not always constant. A patient seen at the commencement of an attack may not reach the maximum of improvement till twelve months later. The maximum of improvement means the maximum of safety when operation is considered. The most dangerous type of case seems to be those of acute onset in very young patients. Occasionally one sees a fulminating case of exophthalmic goitre. They often die in the first attack. I feel sure that surgery in these cases will hasten, rather than avert a fatal outcome.

Recently I wrote to one hundred hospitals in the United States and Canada graded as first class, according to the American College of Surgeons, asking for their statistics, operative and non-operative, on simple, toxic, and exophthalmic goitres. Some were not able to give these statistics on account of their records not being complete. From those who replied, the operative mortality in exophthalmic goitre ranged from five to ten per cent. As these were first class hospitals, it no doubt represents fairly average results. In a few hospitals where one surgeon did all the goitre operations, the reports were very much better.

The operative statistics of simple goitre were very much lower, averaging about one-third per cent. As technically there is no difference in the operation in one case from that of the other, the cause of this high operative mortality in the former must be accounted for by the condition of the patient at the time of operation.

The following is a summary of the operative statistics of my own cases of goitre.

1. *Colloid Goitre*—total, 81 cases.
        Non-toxic—47—Mortality, 1. (Embolus).
        Toxic—34—Mortality, 2. (Thyroid intoxication).
    Operation performed—Bilateral resection.
2. *Adenoma of Thyroid*—total, 65 cases.
    (a) Unilateral—right 42, left 11. (Cystic 11).
    (b) Isthmus—4.
    (c) Diffuse adenomatosis—8.
        Non-toxic—56—Mortality, 0.
        Toxic—9—Mortality, 0.
    Operation performed—Resection—Enucleation.
3. *Exophthalmic Goitre*—total, 38 cases.
        Lobectomy—2—done before 1912.
        Bilateral resection—36—(5 cases in two stages).
        Mortality—1—(before 1912, thyroid intoxication).

Third—Is there any known treatment, by which surgery can be supplanted?

I know of no treatment that gives so satisfactory results as bilateral resection of the gland, provided the operation can be made safe for the patient, and the patient made safe for the operation. X-ray and radium can certainly depress the functional over-activity of the gland, but unless this treatment is carried to a destructive point, I do not see how its action can be permanent. If carried to this stage the whole thyroparathyroid apparatus would be rendered functionless. When an enlarged thymus is present, after sub-total thyroidectomy, x-ray treatment of this gland has been beneficial, but on no account should the conserved portion of the thyroid and parathyroids be exposed to the rays.

In conclusion, I wish to emphasize the following points: 1. In simple and endemic goitres one cannot stress too much the rôle of preventive medicine, and the importance of early active medical treatment. 2. The importance of rest, pre-operative and post-operative in Graves' disease. Kocher pointed out the progressiveness and chronicity of this malady. Therefore, as in all other chronic conditions, no single factor is sufficient in itself to effect a cure, the operation being only one step in the treatment. 3. The time at which operation is undertaken in Graves' disease. This is most important. I believe there is a time when these cases can be operated on with nearly the same margin of safety as in simple goitre. Since I have been observing and selecting this time, I have not seen an immediate postoperative reaction, which has been in any way alarming, as shown by the patient's general condition and pulse rate. 4. Having made the exophthalmic or toxic patient safe for the operation, the operation must be adequate, in order to avoid recrudescence.

The Roentgen Ray in Tonsillar Disease.—The cases treated by roentgen-ray therapy on which Francis L. Lederer, Chicago, reports, were those representing every type of tonsillar disease, and in patients of varying ages. In no case have any marked changes been observed, and only in children with the typical hypertrophied tonsils has even a slight change in size been noted. Patients with infected tonsils with the usual recurrent attacks of tonsilitis were seemingly benefited for a period, only to have a recurrence of the attack. These cryptic tonsils, with the usual infectious material which they harbor, were controlled bacteriologically and found not to have been affected by the roentgen ray. The type of tonsil which has, through disease and age, undergone a fibrosis is but little affected by this therapy. Encouraging results have been obtained not so much objectively as from the alleviation of subjective symptoms, in that type of child whose larynx is filled with lymphoid hyperplasia. The procedure, therefore, is not without some danger. —*Jour. Am. Med. Assoc.*, Sep. 30, 1922.

SOME THOUGHTS ON GOITRE

R. E. McKechnie, M.D.

Vancouver

THE subject of goitre is one that interests everyone of us, both because of its prevalence and because of the obscurity about its causation. No one will dispute the relatively large proportion of cases found among children and young adults, and a lesser proportion among the more adult. This latter would suggest that a large number of these cases, seen in the young, become spontaneously cured before middle life.

In opening my subject, I do not intend to take up the development or the anatomy of the thyroid, but rather bring to your remembrance the work-a-day facts in connection with goitre, which we as busy practitioners are constantly encountering.

There is no doubt that, in the North Pacific States and British Columbia, we have more than our share of goitre. The reports of our school inspectors show, from 20 to 80 per cent. of the female children in our schools are affected with goitre; a much less proportion of males. With us in British Columbia, it is as prevalent in the dry belt as in the wet coast districts.

While cases of goitre may be found anywhere, still, there are certain areas in the world which are notoriously goiterous. But looking for a local cause we do not seem to find one. Some areas are thought to owe their goiterous characteristics to a chalky soil, others to the presence of limestone. Elsewhere a mountainous district blames its hills while another of sedimentary basin formation, thinks it finds the cause, in excess of organic material present in its soil. No two goiterous districts seem alike, even the same range may vary. Thus British Columbia, Washington and Oregon are distinctly goiterous—but I am informed by a Sacramento practitioner that he rarely sees a case there. So it can't be hills or plains or chalk or limestone or excess of organic material in the soil, that accounts for an over proportion of cases of goitre, for these conditions are not constant in the goitre areas. Perhaps no one cause for goitre will ever be found, and perhaps our troubles are of our own making, in trying to find one cause to fit all cases.

However, I shall seek to prove that an absence of iodine is the main cause of the prevalence of goitre on the north Pacific coast. The coast range of mountains is composed of granite, from which iodine is absent. Granite is a plutonic rock, and one can easily see, how, so volatile a substance as iodine, could never lodge in such a matrix. Hence, the waters derived from such rocks must in turn be free of iodine. The Vancouver water supply has been analyzed and no trace found. Hence, locally, we have a population drinking an iodine free water, and in most instances living on an iodine free food. Some years ago, at the Colony Farm at Essondale, only twenty miles from Vancouver, there were many cases of goitre among the livestock, many calves and lambs being born with it. One calf had so large a goitre that assistance was necessary at its birth. This state of affairs was eradicated by the use of iodine, a small dose of a very few grains of sodium iodide given weekly to the pregnant animal, being sufficient to ensure absence of goitre in their offspring. As further evidence, two years ago, at the Dominion Experimental farm at Summerland, all the pigs born that year were goiterous and all but two died. The following year the pregnant sows were given two grains of sodium iodide daily and not a pig was born with goitre.

The experimental work of Marine and Kimball at Akron, Ohio, is also confirmatory. They found 56.4% of enlarged thyroids among 3,872 school children. Six months after a month's treatment with sodium iodide had been given, they found that one third of the small goitres had disappeared, and one third of those marked as moderate goitres, had decreased 2 c.m. or more, thus showing a curative effect. But the prophylactic effect was just as positive. Not only had iodine been given to those with goitre, but a large number without goitre had also been put under the influence of iodine while a third group, also without goitre had had no treatment. Of those without goitre who took treatment, not one at the end of six months showed any thyroid enlargement, but of those without goitre who had no treatment, no less than 26% at the end of six months from the beginning of the observations, shewed enlargement.

Empirically, iodine has been used for a long time in treating goitre, and there seems by these late experiments to have been some basis for its use. In the treatment of tropical dysentry in the past, heroic doses of ipecac were given, often with good effect, a true empirical form of treatment. Now the present day treatment by means of emetine derived from ipecac, proves that our predecessors in the profession, shooting in the dark, had hit the mark. So the Akron experiment at least encourages the belief that prophylaxis may be the successful means of eradicating goitre.

Speaking of iodine I am reminded of an observation of Dr. Pearson at one of our local Vancouver meetings. He pointed out, that our local Japanese did not have goitre and also drew our attention to the fact, that in the food consumed by them, quite a proportion was obtained from the sea; *e.g.*, fish and the dried seaweeds used in soups, etc., and these have a well known iodine content.

In confirmation of Dr. Pearson's idea the following letter to me from Dr. Everett O. Jones, of Seattle, is interesting:

"Ten years ago the valley of the White River, which is south of Seattle, was occupied by white farmers. The occurrence of goitre amongst these people was very common. I used to average two or three cases every month from that district. Since then the Japanese truck farmers have come in and crowded out the whites, so that now the whole district is inhabited by Japanese. So far as I know, no case of goitre has ever been seen in any of these people.

"Last summer I was consulted by a middle-aged Japanese woman who was suffering from a very toxic adenoma. It being the only case of goitre I had encountered in a Japanese, I made some enquiries as to her family, mode of living, etc. I was informed that she and her family belonged to the 'Tony Japs'. They had discarded the ways of their own people and were living as much like Americans as they possibly could to the extent of even employing a white cook. These two occurrences would certainly suggest the thought that there is something in the food or the mode of living of the Japanese which protects them from goitre."

As further evincing the growth of the idea that absence of iodine in the food has some influence in the formation of goitre, or in permitting the formation of goitre, it is only recently I noticed in the public press a note by one of your Winnipeg doctors, who blamed the purity of present day refined salt as a factor. Iodine is found in the brine of salt wells and careful refining removes it from the salt.

In view of the foregoing, would it not be a valuable experiment to have every pregnant woman take short iodine treatments, and would it not be a good plan in childhood, to substitute yearly a course of iodine for the familiar sulphur and molasses; I am beginning to believe that goitre might become a rarity if such plans were universally carried out.

I am well aware that the iodine theory will not fit all cases, as for instance the classic goiterous wells in Styria, drinking of whose water cause goitre; of the statement that the goitre producing element cannot be filtered out, but can be destroyed by boiling, thus suggesting a living organism. My only suggestion would be that a re-checking of these various statements would not come amiss and the result might enhance the value of the iodine suggestion. But looking at the subject from another angle more light may be obtained. Granted that no one excitant cause can be found; that what produces goitre in the sedimentary basin of Akron, Ohio, is different from that at Vancouver or Seattle; still in both cases the influence of iodine is marked. Then we must suppose that iodine acts as a protective agent, enabling the thyroid gland to combat or neutralize the evil influences of the unknown agents which are the causes of goitre.

Classification.—A good deal of confusion has arisen in classifying the various types of goitre, owing to a tendency to multiply these types, and make the classification all embracing. Fortunately a very simple classification suffices for ordinary work, and that as used at the Vancouver General Hospital is all that is wanted.

All goitres are there divided into two classes; Symmetrical and Asymmetrical.

The Symmetrical are divided into: (a) Diffuse colloid goitre; the so-called parenchymatous of Mayo. (b) Diffuse hyperplastic goitre; or the typical exophthalmic goitre.

The asymmetrical consists almost exclusively of adenomatous goitres, with their various degenerations. But in addition, in asymmetrical goitre, we have those cases of malignancy; of abscess, etc., which naturally would create an asymmetry but which being few in number leave the field almost alone to the adenomata. These adenomata in turn are of two kinds—(leaving out the degenerate forms), namely: simple adenomata, and hyperplastic adenomata. Hyperplasia is taken to mean an increase in the epithelial elements lining the acini of the thyroid, and hence when the terms diffuse hyperplastic or hyperplastic adenoma are used they signify toxicity.

It is thus seen that the classification is reduced to simple elements. The thyroid does not increase in size by a multiplication of its acini but either by an increase in the contents of the acini, when we have colloid goitre; or an increase in the cellular elements when we have hyperplasia or toxic goitre.

Based on the foregoing, our pathologist, Dr. Hunter, classified a series of fifty of my cases recently and found as follows: Symmetrical, 36; consisting of: Diffuse colloid, 19; Diffuse hyperplastic, 17. Asymmetrical, 14, consisting of: Simple adenoma, 7; Hyperplastic adenoma, 7. It is thus seen that out of these fifty cases, there were twenty-four hyperplastic, or toxic, and twenty-six non-toxic; nearly half toxic; a higher proportion of such cases than is usually found in a goitre series. But, my observations over a number of years, lead me to believe that this is not exceptional on the Pacific slope, although it does not agree with the published results of some Eastern clinics, *i.e.,* the Mayo's.

Our pathologist, in working over the specimens, made frequent attempts to demonstrate the presence of mitochondria, which Goetsch affirmed were always found in toxic goitre and always in proportion to its toxicity. But failure was recorded, and the hyperplasia, demonstrated by the excess of the epithelial cells lining the acini, was taken to prove the toxicity of the cases. In fact, Dr. Hunter essays to demonstrate the degree of toxicity, microscopically, by noting the degree of infolding of the acinar epithelium. Thus, if the infolding is marked with a consequent increase in the cellular elements there is a high degree of toxicity, while a distention of the acinar cavity with colloid material and a smoothing out of the infolded epithelium denotes a lesser degree of toxicity.

Personally, I think the microscope has missed a number of mildly toxic cases, yet cases which presented the classical picture of Graves' disease. Two years ago, at Spokane, I presented an eleven months' record of sixty-five cases, of which forty-five were clinically toxic; over two and one-half times as many toxic as non-toxic. My last fifty cases rely on the microscope for confirmation and less than half are designated toxic. The discrepancy is too great to be explained away, and I am old fashioned enough to have faith in my clinical findings, even if not backed up by the microscope. However, in my next series I trust to be on firmer ground, having the aid of the basal metabolism tests in diagnosis.

Metabolism is essentially a process of oxidation and it has been found that the excretion of carbon dioxide, as noted in the expired air, furnishes a reliable guide in estimating the rate of metabolism. Thus, if the amount of carbon dioxide is greater than normal, we have increased metabolism. If less than normal, then we have lessened metabolism. This works out in practice, for hyperthyroidism is accompanied by increased metabolism in direct ratio to its gravity, while hypothyroidism is accompanied by metabolism below the normal. The value of this knowledge is so great, that, Charles Mayo says, "a failure of diagnosis is almost impossible if the metabolic rate is taken into consideration with other general symptoms."

It seems that the estimation of the basal metabolism rate as applied to goitre is proving the most valuable aid in diagnosis and treatment elaborated in recent years. Enumerating the various advantages of this method, Eberts, in the *C.M.A. Journal,* of March, 1921, says:

"In hyperthyroidism, basal metabolic methods are of great value clinically in the following ways: (1) In determining the degree of toxicity in cases of toxic goitre. (2) In determining the operative risk judged by the degree of toxicity. (3) In determining whether in a given case of toxic goitre, especially the exophthalmic type, the individual is approaching or receding from a crisis—information of great importance where an operation is under consideration. (4) In determining whether, in cases of large goitre with symptoms resembling hyperthyroidism, these symptoms are due to hyperthyroidism or not. (5) In differentiating, in the presence of goitre, between tachycardia of nervous origin and that due to increased thyroid activity. (6) In discovering the effects of operation, *x*-ray treatment, the administration of thyroxin, or other modes of therapy."

Abbott, in the same issue, has the following to say:

"A word only can be said, on the clinical import of alterations in the basal metabolic rate, as revealed in the very large number of observations, which the literature cited here represents. Normal changes lie between the relatively narrow limits of -10 and $+10$ per cent. following a similar range, although with somewhat greater fluctuations, to that of the body temperature. Variations appear to depend upon alterations in the active principle of the thyroid secretion, which has to do with the regulation of heat production, and very high values as $+80$ to $+100$ per cent. may be said to be pathognomonic of hyperthyroidism. The converse applies to hypothyroidism, in which the rate may be depressed to the lowest figure consistent with life (-40 to -45 per cent.). A raised rate is most useful in the differentiation of thyrotoxic from adenomatous goitres, and in the diagnosis of those "borderline cases" of thyroid toxicity without exophthalmos which demand treatment, yet frequently escape recognition. In the "irritable heart of soldiers" the normal rate has supplied a valuable negative point against the hyperthyroidism sometimes hypothecated. Alterations in the rate with corresponding changes in the clinical picture, follow administration of thyroid with almost mathematical accuracy, and supply an invaluable index in the gradation of therapeutic doses of thyrotoxin, which is cumulative in its effect. Similarly, in hyperthyroidism, the surgeon is guided to a definite knowledge of what cases demand interference, and of the effect of lobectomy or *x*-ray treatment, when these steps have been taken, by estimations of the metabolic rate. Without it he will operate unnecessarily on many cases, and on many others without the success that should be his due."

From the foregoing it would appear, that the use of this method, both in diagnosis and in estimating the danger of operation, in hyperthyroid cases, is imperative and its non-use almost criminal. I may be radical in my views but I believe that if the profession could be educated to believe in early operation in toxic cases, a great advance would be made. We all remember the discussion about the right time to operate in appendicitis, and know that many lives were lost by waiting for the optimum time to arrive. Murphy crystalised the growing opinion of the profession when he enunciated his dictum that, "the best time was as soon as appendicitis was diagnosed."

Similarly in cases of hyperthyroidism, if instead of waiting until the case got serious, an early operation was performed, many lives would be saved. The majority of these cases demand operation, probably a larger proportion than in appendicitis, so why not at once face the question boldly and enlarge Murphy's dictum to include toxic goitre?

Having diagnosed the case, it is then open to discussion as to what form of treatment is advisable. Physicians contend that many cases are susceptible to treatment and I will not dispute that view with them. Certain forms of treatment I would condemn—as the injection of boiling water—an unsurgical procedure and not without danger; *x*-ray treatment which seems to benefit for a time but whose benefit is not permanent, and which renders a subsequent operation much more difficult, etc. The former practice we hear little about to-day, but the latter is still extensively practised as the surgeons can testify.

Personally, I have but little faith in any form of treatment after a goitre is fully established, say for one to two years. The goitre of adolescence is the most favourable and it is that type that Marine and Kimball found to re-act so readily to sodium iodide.

Toxic goitre is also in a class by itself. The exophthalmic type is more vicious than the toxic adenoma. This latter has remissions when the growing adenoma, with its poor blood supply, finally starves the cortical hyperplastic cells. But a recrudesence is apt to occur as other adenomata begin to grow and the cycle is repeated; repeated many times in the one patient perhaps. These remissions do not occur in the diffuse hyperplastic goitre, but the patient is continuously ill, the seriousness of the symptoms varying with the virulence of the case.

As to treatment in such a case, rest is the most important, but rest and all the drugs in the pharmacopœia will not definitely cure. Surgery offers the only positive treatment. If undertaken early, before extensive myocardial degenerations have taken place, a 100% cure should be looked for: if delayed too long, these degenerations will remain, the patient's condition being improved somewhat by the operation, but never regaining normal. Hence my plea earlier in this paper, for early operations in toxic goitre and the earlier the better. And since by means of the basal metabolism test we have a sure means of proving whether a given case is toxic goitre or not, our opinions should be strengthened and confirmed when a positive result is obtained, and no hesitation should take place in urging an early operation. Until the profession takes this advanced position, many a case will drift into hopeless invalidism and some to an early death. And in my opinion both forms of toxic goitre should be treated alike.

As for the non-toxic forms there is no such urgency. Some of you will recommend operation on account of disfigurement, some for pressure symptoms. As regards these latter death is not unknown from the continuous pressure on the trachea and atrophy of its cartilaginous rings, caused thereby.

As for the risks of operation, in the non-toxic cases they are almost nil; but in the toxic, you have to do a major operation on a patient seriously weakened in the most vital organ, the heart, and the victim of chronic poisoning. Here then the risk is grave, and operation is not to be lightly undertaken, without thoroughly investigating the patient's condition. And here again the basal metabolism test gives the best guide to go by in deciding when to operate. It is very pleasant to read the tests, from time to time, at intervals of three days, after the patient has been put to bed with an ice collar over the gland. Perhaps our first reading was plus 66, with a heart rate of 140, and then dropping to 60, 55, 45, 40, with perhaps the pulse down to 100 with the latter. One can safely operate when this stage is reached, that is if it is ever entirely safe in toxic cases which have been allowed to advance too far.

I do not intend to try your patience any further. The technique of the operation you all know and probably all I have told you to-night you know too. But it is well sometimes to be reminded of things and I trust my paper will have answered in that respect if in no other.

THE GOITRE PROBLEM—FROM THE PATIENT'S STANDPOINT

F. N. G. Starr, C.B.E., M.B., F.A.C.S.

Toronto

AN old Greek proverb says: "You can pick your olives, but you cannot pick your company." We in this old world of modern medicine, while we may pick our treatment, we cannot pick our cases.

If an expectant mother has a goitre of any kind she must needs have the greatest care lest a simple adenoma, or a simple general enlargement, under the stress of pregnancy become hyperplastic, and thus not only ruin the health of the mother, but militate against the health of the child soon to be born. As in the domestic animal, so in the human being, the exophthalmic mother may give birth to an infant with hyperplastic goitre.

I am not sure, now that our salt is so purified that it contains no iodine, the milk so pasteurized as to lose some of its vitamine A, and the flour so white that much of its food value is lost, but that in the prenatal care mothers should have a course of iodine at varying intervals during pregnancy, whether they show any sign of goitre or not. A useful means of bringing this about would be to have them learn to eat seaweed. Dulse can now be procured in many of the shops of inland towns, and when the taste is cultivated people may learn to eat it as a vegetable, raw or cooked. It seems to me that the great problem of the family physician is to maintain the fat-thyroid-iodine balance, and the day may come when goitre, even in childhood, will be unknown

There are but few cases recorded of hyperplastic goitre in infants under five years of age. The probability is that few are recognized before the infant has passed to the Great Beyond. From five years of age to puberty there are more cases. In some goitre areas as many as fifty per cent. of the school children under twelve years have some form of goitre. Buford[1] reports a case of hyperthyroidism in a child of six years, for the cure of which it was necessary to resort to surgery. At least seventy-five per cent. of the goitre cases seen in early childhood or early adolescence can be cured before the age of twenty by proper hygienic surroundings and by the judicious administration of the iodides; while if neglected and advised to leave them alone to be "grown out of"—whatever that may mean—fully seventy-five per cent. of them will cause symptoms or deformity later in life. It behooves us then to be up and doing, for after that age there is no treatment other than surgery, even when it is applied by the most skilful physician, that will give any hope of recovery. On the other hand, surgery often gets a black eye in trying to cure late hyperplastic cases which have already developed permanent cardiac damage from a too prolonged effort on the part of the physician.

Radium will not cure any type of goitre. I have operated upon many cases after their money has been used up in vain attempts at cure by means of radium.

X-ray will not cure hyperplastic goitre and it is silly to try it in adenomata or in colloid. At one time I thought it might cure hyperplastic goitre and I made up my mind to find out. Two cases improved under treatment and, when after several months they were pronounced cured by the roentgenologist and the physicians in attendance, I resected the thyroid gland and to my surprise the pathologist found no difficulty in reporting a hyperplastic enlargement, there having been practically no change in hyperplasia. They *are* cured now and have remained so for several years. Moreover, the *x*-ray is dangerous. One of our cases had such a storm following the initial treatment that she died, and two others so nearly passed out that I came to the conclusion that there were other and safer means of dealing with this dread disease. The extraordinary thing is that an occasional case recovers spontaneously, hence the advantage of prolonged rest on the offchance that permanent relief may be obtained.

Hyperplastic goitre and hyperplastic adenoma must be approached by the surgeon with great caution. It is well that the basal metabolism should be done and if it is 145 per cent. of normal, a continuance of rest should be advised. Sometimes a metabolism may not be above 135 per cent. of normal and yet an astute clinical observer will consider it wiser to delay surgical interference until he has fully gained the confidence of the patient, and the patient has developed a more placid mind. In the extreme cases it is better to do a ligation, first of one pole under local anæsthetic, and in one to two weeks a ligation of the other. Each of these painless stages not only brings about a certain amount of fibrosis in the gland, lessening the secreting area, but gradually brings about sympathetic correlation between the patient, the surgeon, and the staff, all of which are helpful. After the second ligation the patient is then sent away to be quiet, where she may be rescued from spying friends and alarm-raising sympathizers! In about three months she will return, when the whole operation may be completed with little more storm than the average extraction of a tooth causes.

Some surgeons preach that unless a goitre is giving symptoms it should be left alone. Why under Heaven a patient is to be condemned to parade an unsightly lump about all his days, or until such time as he may have the good luck to have a hæmorrhage into the cyst and suddenly become a grave case—in more senses than one!—or wait until malignant change has supervened, I cannot understand. Therefore, in the interest of the patient, in all adenomata, simple or colloid, or diffuse colloid, I advise removal as the more sane and rational treatment.

REFERENCE

1.—BUFORD, *J.A.M.A.*, May 20th, 1922.

Local Use of Acetyl-salicylic Acid.—Heller (*Therap. Gazette*, December 15th, 1921), from the experience of 1000 cases convalescent from tonsillectomy, advocates the local application of acetyl-salicylic acid after tonsillectomy, and in acute pharyngitis, for the relief of disphagia; 1 to 3 decigrams (1½ to 4½ grains) of the powdered drug are given on the tongue eight to ten hours after operation, and repeated ten to fifteen minutes before each meal for three or four days. Relief is almost universal, swallowing being comfortable immediately the powder has passed the oropharynx. A weak solution (3 decigrams to 30 c.cm. of water) may be used as a gargle with practically the same result. In acute pharyngitis or tonsillitis similar results are obtained if 1 to 3 grains are placed on the tongue without water every three or four hours. The effect is produced by its local action and not by the septicaemic effect of the drug.

EXOPHTHALMIC GOITRE

J. K. McGregor, M.B., F.A.C.S.,

McGregor-Mowbray Clinic, Hamilton, Ontario.

THE object of this paper is not to review the subject of exophthalmic goitre, but rather to briefly outline some of the more important points pertinent to this disease. Any discussion would be incomplete without some consideration of all types of goitre and an attempt at their classification. We have disregarded such rare types as malignancy and thyroiditis and made the following divisions—(1) *simple goitre*, (2) *toxic goitre*, (3) *exophthalmic goitre*. Simple goitre may be disposed of by suggesting the expediency of all school Boards considering preventive administration of some form of iodine, but with this caution, namely, that work of this kind should only be undertaken under the supervision of the family physician, and with the knowledge that harm may occur if iodine is introduced into a child who has already developed some signs of hyperthyroidism. The question arises then, should these cases all be metabolized before being treated? In the district around Hamilton fully twenty per cent. of the female population between certain ages have some form of thyroid trouble. In districts farther north, seventy-five per cent. of the same class are affected, so that when one considers the number of cases which will develop toxic or exophthalmic symptoms, the question becomes an economic one paralleling that of tuberculosis or cancer. The underlying factor in simple goitre may also play a major part in the causation of the other two classes and one cannot help being struck by the reasoning of Plummer[1], who has suggested that "The introduction of bacteria into the digestive tract is an important factor, if not the primary cause of endemic goitre, and that the bacterial flora of the digestive tract may sufficiently interfere with the absorption of the small amount of iodine in the available diet is a possibility. The relation of the bacterial flora to the available iodine would well explain the geographical distribution of endemic goitre".

No satisfactory reason has been given why simple thyroids develop toxic or hyperthyroid characters

Symptoms and Diagnosis.—In the differential diagnosis the following points should be noted: Toxic goitre has no definite onset, and is usually found in a patient who has had an enlarged thyroid since puberty. The average age of the patient is thirty-four, and the symptoms for which they consult a doctor are those of failing compensation. Exophthalmic goitre on the other hand, has a definite onset, usually in a younger patient, with the nervous phenomena predominating. Loss of weight is marked in exophthalmic goitre, while the appetite is generally good. Crile in his recent work says that toxic goitre should be regarded as a degree of hyperthyroidism and that the clinical results and treatment are the same. With this we cannot agree, because we know that the preliminary operations do not give the same good results in toxic goitre as in exophthalmic goitre, nor are the end results as good in exophthalmic goitre, following extirpation of the gland, as in toxic goitre.

The symptoms of exophthalmic goitre in the order of their appearance (Plummer) are as follows: (1) Nervousness; (2) Tremor; (3) Fast heart; (4) Enlargement of the thyroid; (5) Weakness; (6) Loss of weight; (7) Sleeplessness; (8) Diarrhœa; (9) Vomiting; (10) Mania.

Points which we consider to be important in the examination of a patient are: (1) What phase of the disease is the patient in? (2) What was the loss of weight from normal and what has been the gain? (3) What has been the period of rest and what other treatment has been received? (4) What is the loss of strength, especially in the quadriceps muscles? (5) What is the degree of excitability? (6) What are the changes in the heart? (7) What is the condition of the mediastinum, both from clinical and x-ray examination, with regard to substernal goitre or enlarged thymus? (8) What is the condition of the vocal cords? (9) A general consideration of the possible presence of focal infection as a cause, and its bearing upon the convalescence of the patient.

The toxæmias, such as influenza, a disordered action of the heart, and functional neuroses, which have been so difficult to differentiate from the mild hyperthyroid cases, are easily ruled out since the advent of the basal metabolic test. Upon this test we place absolute reliance in the differential diagnosis of these borderline cases, but we must add that in our opinion it is imperative, if one is not to be misled, to have a carefully trained technician giving his whole time to this work and that he have at his disposal no cheap form of commercial apparatus, but the very best that can be acquired. We are rather fortunate in having in our City Hospital, at the head of this department an investigator properly trained through the kindness of Dr. Boothby at the Mayo Clinic[2]. About 600 tests upon 400 patients have been made in a period of two years and in a large percentage of these cases which we have been able to follow, we have found but few cases where the B.M.R. did not prove of distinct value, either from a diagnostic standpoint or as an estimate of where the patient stands in the course of the disease.

Treatment.—It seems unnecessary to say that at the outset of any plan of treatment, the confidence of the patient and friends is indispensable and above anything else the physician or surgeon conducting the case must not be "hurried" into this or that form of treatment. It should be understood that although an attack upon the thyroid gland itself in a disease which very possibly is linked up with other organs may not seem rational, we are faced with the problem of returning a patient to permanent good health as safely and quickly as possible. This must be accomplished on the experience we have gleaned from our present day knowledge of the disease. Yesterday exophthalmic goitre was a medical disease. To-day it is to a very large extent a surgical one. To-morrow it may belong to the radiologist, or again to the physician.

The first symptoms of this disease should be treated by rest in bed, and surgery in any form is inadvisable. Medicine in our opinion has no effect upon the disease in any stage. Radium and x-ray in our hands have helped bad cases, improving them clinically, reducing the basal metabolic rate, but *will not hold them.* The first mild infection lights up another exacerbation. Ligations are of immense value in putting a patient into a condition where a thyroidectomy may be safely done. It also is the best way of testing whether radical operation is likely to throw the patient into an acute attack of hyperthyroidism or not. Extirpation of four-fifths of the gland, in our experience and from what we have been able to observe, is the only sure method of stopping the disease and enabling the patient to resume good health. Every possible focal infection should, of course, always be cleaned up as a part of the treatment. Transfusions should be used more often in bad cases, and in one case at least I was able to avoid a post-operative fatality by this procedure.

The anæsthetic of choice is gas, oxygen, plus local (.5% novocain). A trained anæsthetist with some personality, who can inspire confidence in the patient during the operation, without disturbing everyone in the operating room, is of great advantage. Ligations by preference are done under local anæsthesia. A high transverse incision two and one-half inches long, and proper retraction of the superficial fascia will expose the muscles. Care should be taken at this point not to get between the fibres of the sternomastoid. It should also be remembered that there is often a large branch of the superior thyroid, ligation of which will be unsatisfactory. The same may be said of ligation of the upper pole *en masse,* which is so often done, at the same time missing the main vessel, as pointed out by Pemberton.

If a distinct reaction follows ligation, a second ligation will be necessary, and the patient may be sent home for two or three months, when he will return with a gain in weight and strength, and usually with a marked drop in the basal metabolic rate.

Ligations or thyroidectomies in very bad cases may be done in bed, as advocated by Crile, with less disturbance to the patient than by taking him to the operating room. In our experience this method is a step forward, although it requires some change in operating technique, and is rather a marked physical strain on the surgeon and his assistant.

Thyroidectomy in exophthalmic goitre is not the easy operation which many of us have considered it to be. It has been pointed out repeatedly by Crile, Pemberton and Sistrunk that those deaths which formerly we considered "Acts of God" and "Uncontrollable", are very likely due to some damage done at the time of the operation. This damage is not caused, as has sometimes been thought, by the liberation of additional thyroxin into the system, but rather to injury to the laryngeal nerves. Pressure on one or both of these nerves in elevating the gland, or by ligation, etc., is very easily made and may be followed by an abductor paralysis. This will produce fixation of the cord and prohibit entrance of oxygen into the lungs of a patient who is in need of more than the normal amount. An additional tax is thus thrown upon the diseased myocardium, which may terminate in a fatality. A tracheotomy at the time of operation, when these patients develop difficulty in getting their breath, will very often save the patient's life. It, however, adds very much increased risk to the operation. To avoid this accident, therefore, one must bear in mind that the nerve lies in close proximity to the larynx, and that it is liable to be injured from the outside, especially by clamps. A dissection from the inside after releasing the upper pole, enables one to preserve the posterior capsule of the gland, and if your forceps are placed in a horizontal direction as guides, the margin of danger is very much lessened. Snipping of a vessel, usually the branch of the inferior thyroid at this point, is of extreme danger, and it will necessitate a ligature in a most vital area. It should also be remembered that in elevating the gland, especially the last lobe to be taken out, the laryngeal box is twisted on itself and what we may think is the anterior of the larynx is usually the side of it. This, of course, will pull the nerve up with it and expose it to an increased danger.

Post-Operative Treatment.—The patient should return to a darkened, well ventilated room where absolute quiet prevails. The nurse should be chosen for her ability to inspire assurance of well being, and one quick to note any change in her patient's condition. The pulse rate is the indicator and careful attention to rate, rhythm and volume is most essential. To control tachycardia, arrhythmia and restlessness give morphia *ad libitum;* keep the patient drowsy. Usually one-sixth of a grain every two hours will suffice, though many require much more. Apply ice to the præcordium and neck.

For mucus in throat and tickling, inhalations of Friar's balsam are helpful, as are sips of ice water. Ice chips are soothing though later they may produce a stomatitis.

This treatment is all that is necessary for most cases. However, should the patient exhibit the slightest sign of air hunger, with increasing pallor verging on cyanosis and a definite decrease in pulse volume with irregularity, transfusion is indicated. Drains are removed on the second day, stitches on the fourth, the patient usually leaving the hospital on the fifth day.

Results.—Between sixty-five and seventy-five per cent. are cured; from fifteen to twenty per cent. are improved and a small percentage unimproved. A mortality rate of one per cent. should be aimed at and does not seem unreasonable. "Fatalities in a large measure are due either to the selection of a wrong patient for operation or a wrong operation for the patient"[3]. The operator in this field will be well rewarded for all his care and patience by results which surpass in our opinion, those of any other branch of surgery.

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Hematurias of Obscure Origin.—The rôle of nephritis, toxic and infectious, in the etiology of hematuria, is mentioned by A. R. Stevens, New York, and attention is called to the possibility of an entire absence of other signs of the disease. The possibility of two or more existing causes of hematuria giving rise to error has been illustrated. Some of the established rarer causes of bleeding and the newer ideas regarding obscure hematuria are mentioned. Clinically, it seems safer to Stevens to regard all bleeding as due to some tangible anatomic lesion or a less evident one of toxic origin, and saner to discard the notion of idiopathic hematuria. The latter diagnosis cannot reasonably be made until after death, and when a complete necropsy has failed to assign a cause for blood in the urine; and only then should resort be had to vasomotor or neuropathic theories in final explanation. But remembering the frequent irregularity of hematuria due to serious lesions and its proneness to cease for long periods (with or without treatment and whether the treatment be manipulative or surgical), it would seem that the best interests of the patient and of medicine will be served by thorough and repeated examinations and insistence on observation over a period of months or years, if this can be done tactfully, without upsetting the patient's morale.—*Jour. Am. Med. Assoc.*, October 14th, 1922.

COMPARISONS OF CLINICAL AND RADIOLOGICAL FINDINGS IN LUNG DIAGNOSIS*

F. S. Bissell, M.D.

Minneapolis

THE conviction that close co-operation between the lung specialist and the roentgenologist is essential, in the diagnosis of pulmonary disease, has led the writer to enlist the assistance of Dr. W. J. Marcley in this study. Out of 265 cases examined for the U.S.P.H.S. during part of 1919 and 1920, 114 cases, in which a satisfactory examination had been completed by both of us, were selected and the result of the study tabulated.

It is perhaps unfortunate from a scientific point of view that any diagnosis of tuberculosis in its earliest stages may justly be questioned on the ground that there is no single infallible test, uninfluenced by the judgment of the examiner, by which the correctness of such a diagnosis may be proven. Nevertheless, careful observation for a sufficient length of time, skillful elicitation and conservative interpretation of physical signs, study of pulse and temperature curve and the determination of sensitiveness to tuberculin administered subcutaneously, will produce a mass of evidence which should be acceptable in any medical court. And it is a study of this kind against which roentgen observations are checked in this series of cases. A similar study was made in collaboration with E. T. F. Richards in 1913 and was published in the *American Journal of Roentgenology*.

Technique. It seems necessary to repeatedly emphasize two important considerations in the hope that they may eventually find a place in all criticism of the roentgen diagnosis of pulmonary disease: (1) The lung roentgenograms from which safe deductions may be drawn, must be of the best quality, prepared according to a standard technique. (2) That much intensive study and large experience are quite as essential to intelligent interpretation of roentograms as they are to other special kinds of diagnostic procedure.

Important factors in technique are: (1) Position of patient (vertical—breast against plate, scapulæ thrown outward); (2) Tube distance and shift (accurately correlated); (3) Exposure time not exceeding 1-10 second); (4) Tube (fine focus): (5) Accurate time development.

The advantages of co-operation. It is indeed disheartening, in this day of medical advancement, to so frequently observe men, without sufficient experience to appreciate the pitfalls, attempting to interpret lung roentgenograms that would be wholly unreadable to the most experienced. The writer would not discourage the laudable efforts of those interested in lung diseases to familiarize themselves with x-ray diagnosis, but would merely emphasize the danger of relying too much upon their own roentgenological deductions until they have given the subject as much or more study than they have found it necessary to devote to other diagnostic procedures. The roentgenologist with his greater experience in the interpretation of lung stereograms could be of much greater assistance to the clinician if he were more in the latter's confidence. There is a well marked disposition on the part of most clinicians to withhold from the roentgenologist (consciously or inadvertently) clinical data in their possession. From a practical standpoint, this is ill-advised since it may lead the roentgenologist into avoidable error and this in turn may mislead the clinician himself. The roentgenologist should be treated as any other consultant and supplied with all information available. He is then in a position to confirm, refute or supplement the clinical findings.

In our opinion, however, too much reliance has been placed upon the so-called "fan" or "cone." While this is doubtless a sign of great value when present, many correct diagnoses of early pulmonary tuberculosis can and must be made without its aid. We stress the point because many workers in this field have been led by

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Dunham's emphatic statements to search their sterioscopic plates only for the "cone" and not finding it, have discredited the roentgen method by failing to make the correct diagnosis. Dunham, in his latest publication, does not stress the value of the "cone" as he has done in previous papers.

Roentgenological observations. A careful review of a large series of known tuberculous cases of many different types and in various stages of development has failed to show a single instance in which there were not abnormal lung markings in the periphery of the upper lung field beyond the distribution of the terminal bronchi. It would seem, therefore, that for practical purposes at least, the rule may be laid down that a negative diagnosis is indicated when the lung parenchyma within this part of the lung field is free from all evidence of infiltration. While it is true that tuberculosis may chiefly involve the lower lung fields, this study seems to indicate that there are always some signs of the disease within the area described. These tuberculous lesions take the form of small patches of fine tubercle-like shadows. If the disease is active, they usually have a cloudy appearance and there is no perfectly normal lung area between them and the hilus. If, on the other hand, the disease is arrested, healed, latent, or of the concealed type, these patches are less cloudy in appearance and the lung area around them appears relatively normal. There are a few other pathological conditions which produce changes similar to these in the upper lung fields. Jarvis has proven their occurrence in marble cutters' disease. Such exceptions to the rule make the positive diagnosis somewhat less reliable than the negative, but experience in recognizing the differences in the character of these various shadow formations minimizes the danger of error. The literature upon this subject contains frequent references to peri-bronchial infiltrations, the inference being that these are somewhat characteristic of tuberculosis. Our observations lead us to conclude that peri-bronchial infiltration is much more characteristic of other infections or bronchial irritants and that they should receive little consideration in the diagnosis of tuberculosis. A certain type of hilus thickening, frequently associated with calcareous deposits, has some contributory value since it indicates a past tuberculous infection which may have become reactivated. Evidence of fibrosis may be accepted as pointing to a tuberculous process when it occurs in the upper lung fields or when there are other signs more or less suggestive of that disease.

Cavitation. Tuberculous cavities may usually be recognized by dense annular shadows within which normal lung markings cannot be seen. Patches in the lung with absolutely dense centres indicating a caseating process are usually present with such cavitations. The cavity of bronchiectasis is differentiated by its thinner wall and more cylindrical contour. Pulmonary abscess, theoretically, cannot be differentiated from a filled cavity, but the latter is a rare finding in the study of roentgenograms. The small circumscribed pneumo-thorax is difficult to differentiate from a cavity situated near the pleura, but this again is a rather uncommon location for a tuberculous cavity.

Determination of Clinical Activity. Our statistical observations seem to indicate that the roentgen method is of great value in determining the degrees of activity of tuberculous lesions. In cases, diagnosed inactive, the subsequent history or course of the disease agreed as a rule with the x-ray observations. Cases diagnosed as probably active show a somewhat larger percentage of error, the evidence of activity probably being due to mixed infection. It is here that clinical evidence, as shown by temperature curve and case history, is of the greatest value. Our roentgen reports show an increasing number of cases classified as tuberculous but with the question of activity indeterminate. This is because we have come to believe that the question of activity can usually be determined by clinical evidence and that the function of the roentgen examination is rather that of determining the site and extent of tuberculous lesions, presence of complications, or the complete absence of roentgen signs of clinical tuberculosis. It should be borne in mind that the more characteristic signs of early tuberculosis are probably caused by lymphatic engorgement and local congestion and hence will disappear as the process becomes inactive. A diagnosis of clinical tuberculosis, based upon the presence of old tuberculous lesions without evidence of recent activity, tends to discredit the roentgen method.

Roentgenological Prognosis. In a previous paper "Concerning a Roentgen Conception of Pulmonary Tuberculosis," an attempt was made by the writer to so classify various types of tuberculosis from a roentgen standpoint, that roentgen reports might be of greater value in establishing a correct prognosis. Briefly stated, the various factors upon which prognosis could be based were: (1) The type of infiltration (either discrete or conglomerate); (2) The extent of lung involvement; (3) The presence of old healed lesions in other parts of the lung; (4) The amount of fibrosis; (5) The presence of cavities and areas of caseous pneumonia. Thus in type "A", so-called concealed tuberculosis, the prognosis is favorable as to life, but less favorable as to complete recovery of normal health. Type "B" is a more frank tuberculosis with typical clinical history, with marked fibrosis and no cavitation. In this type, prognosis is favorable under proper management. Type "C" represents those cases in which there is an early tendency to cavitation, in which there are massive conglomerate shadows in the roentgenogram indicating the presence of caseating pneumonia. This is the most unfavorable type from the standpoint of prognosis. Type "D" the healed tuberculosis, showing the characteristic scars, broken linear markings, the pleuritic cap, the calcification, etc. It is thus seen that stereoroentgenograms of the lungs, when properly studied, are of great value in arriving at a prognosis. While the roentgenologist cannot, with conservatism, venture a prognosis in a given case, he may aid the consultant by emphasizing these factors in the report, which are a direct indication of the probable course of the disease. Thus a simple diagnosis of fibroid tuberculosis is insufficient unless qualified by a full description of all observations including cavitation, caseation, the presence of disseminated or discrete lesions, and their distribution. Such a classification as this one serves the further purpose of clearly pointing the way to complete co-operation and understanding between the roentgenologist and the clinician.

Roentgen report. Since the communication between roentgenologist and clinician is usually a written one, a clear and concise terminology based upon an accurate conception of the disease is an essential requirement. While observations may be described in terms of variable densities, conclusions must be a translation of those observations into pathological terms. With the pathological conception thus established, an opinion as to the actual disease present is a logical sequence. Such an opinion may be positive in character when observations have been sufficiently characteristic to justify the conclusion that a tuberculous lesion is present. The opinion may be qualified by a statement as to the probable activity or inactivity of the disease and a suggestion as to prognosis. A report may be negative in character and this should mean that there is no evidence in the roentgenogram of pathological changes in any sense characteristic or even suggestive of tuberculosis. The report may be indeterminate which should mean that there are changes present but that they are neither sufficiently characteristic to justify the conclusion that they are due to tuberculosis, nor clearly enough of negative value to warrant a negative diagnosis. An indeterminate roentgen diagnosis may very properly be used with considerable frequency but should not be employed as a subterfuge and should always be fully explained in the body of the report. A re-study of the plates in the group of indeterminate cases has convinced the writer that most of them may be placed with accuracy in either the positive or negative group. In fact, it was found that the observations described in the body of the report usually gave a direct indication of the group to which the case belonged. Tubercle bacilli were later found in the sputa of three of this group, but a re-examination of the plates showed abundant and characteristic evidence of tuberculosis. This shows that the error was due to hasty observation and carelessly drawn conclusions on the examiner's part, not to a fault in the method.

The negative report. The negative report has, for some reason, not been given the high place in the ensemble of diagnostic data which it deserves. Such a report when made by a competent roentgenologist, under favourable conditions, may well be accepted as conclusive, even though all other signs seem to indicate pulmonary tuberculosis. While no effort should be spared to exclude the ever-dangerous element of human error, it is doubtful whether a diagnosis of pulmonary tuberculosis is ever justified in the face of repeated negative roentgen findings. A careful review of our series of plates in conjunction with the subsequent histories of patients, has so far failed to reveal any instance where the stereoscopic plates were entirely negative, and the case later proven to have pulmonary tuberculosis.

Indeterminate report. About twenty per cent. of our cases are classified as indeterminate on the ground that there are atypical changes in the lung fields which render a negative diagnosis inadvisable and a positive diagnosis dangerous. Certain cases of chronic pleuritis in which there is, or has been, an exudate, and in which the entire lung field appears abnormally dense, on account of pulmonary infiltration, fibrosis or induration of the lung tissues, must be classified as indeterminate, since it is impossible with these changes present to exclude tuberculosis. There are also the post-influenzal infiltrations, streptococcus broncho-pneumonias and their sequelæ, such as bronchiectasis which must occasionally be classified as indeterminate with respect to tuberculosis.

Positive roentgen report. In rendering a positive diagnosis of pulmonary tuberculosis, solely based upon roentgen evidence, one is beset with danger on every hand. A pulmonary infarct associated with bi-lateral infiltration may not have been considered, and its close resemblance to an active tuberculous process may make the slip easy and the fall hard. There is the passive congestion of chronic heart disease, the so-called dust inhalation diseases and the streptococcus infections mentioned in the previous paragraph which must be carefully borne in mind, and, if possible, differentiated, but if reasonable care is taken in preparing and interpreting lung roentgenograms, and if the interpretation is founded upon broad roentgen experience and pathological knowledge, the positive roentgen diagnosis of pulmonary tuberculosis will be correct in a large percentage of cases.

SUMMARY

This paper should be received as supplementary to certain others published by the writer during the past ten years. There is no attempt to present any new material, but merely to emphasize certain conclusions which time and experience have strengthened: (1.) That co-operation between roentgenologist and clinician are highly important in the diagnosis of chronic lung disease. 2. That the relative values of various diagnostic procedures employed for the recognition of early tuberculosis are as follows: (A) History and symptomatology. (B) Roentgen study. (C) Sensitization to tuberculin. (D) Physical signs. (E) Laboratory tests. The roentgen examination is placed second because while lesions may be demonstated in the stereoplates of practically all cases, their exact significance is determined by the case history and the symptoms. Again, the symptoms *per se* have great diagnostic value since experience has shown that the early symptomatology of tuberculosis is always suggestive. Dr. Marcley regards the tuberculin test, when properly applied, in small doses of tuberculin, as of very great value. A high sensitization to tuberculin, conjoined with positive roentgen findings, however slight, justifies a positive diagnosis. Our study indicates that the mere presence of positive signs in the upper lung field should not have too much weight in the diagnosis of pulmonary tuberculosis. While we have placed the laboratory examination last in the list, the work of Larson at the University of Minnesota may elevate laboratory procedures to the head of the list. This, however, will require time for development and proof. The finding of tubercle bacilli in the sputum is a rare occurrence in early tuberculosis and, even when present, does not absolutely prove the existence of pulmonary tuberculosis.

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DIAGNOSIS OF EMPYAEMA*

Willis S. Lemon, M.B. (*Tor.*)

Section on Medicine, Mayo Clinic, Rochester, Minnesota.

WHEN the lung is consolidated in acute disease there are certain associated phenomena that enable the examiner to picture this pathologic state. During resolution, a progressive change in the pathological anatomy takes place; the tissues change from airless lung to partial air-holding lung, and finally become normal.

If the normal sequence does not take place, the condition of so-called delayed resolution obtains. The breath sounds vary from bronchial to broncho-vesicular or vesicular-bronchial, or they may be diminished; bronchophony becomes weak, fremitus may be increased, flatness may replace dullness, or dullness may remain almost unaltered. The temperature and the pulse rate, which have become normal or nearly so, again rise slowly and are highest in the afternoon. Sweats recur and the leukocyte count shows advancing leukocytosis. In my experience delayed resolution is an unusual phenomenon and a most dangerous diagnosis to make.

Delayed resolution requires a consideration of four possibilities. Unresolved pneumonia should be considered only when all other possible pathologic changes are excluded by a thorough canvass. These are in order of frequency: empyaema, encapsulated empyaema, multiple abscesses, unilocular parenchymatous or extrabronchial abscess, and one of the forms of acute pneumonic tuberculosis.

General consideration of empyaema.—As Ashhurst has shown, all empyaema is, in a sense encapsulated. Necropsy furnishes indisputable proof that purulent effusions tend to form adhesions and become sacculated, whereas serous effusions, or serous effusions with air, do not. However, the empyaema usually spoken of by the clinician is that which occupies a part or the whole of the pleural space. Encapsulated empyaema refers to the pockets of purulent material lying in fissures between the lobes of the lung, between the lung and the pericardium, between the lung and the diaphragm, or, in brief, wherever two pleural surfaces approximate. One cannot be certain that these collections of pus are the result of the rupture of a subpleural abscess as Moscowitz and others believe, and as Aschner infers from his pathologic study. I have known of only two instances in which it seemed reasonable to suppose that rupture actually took place and in these there were severe and critical symptoms of pain, dyspnoea, and shock and later signs of rapidly forming effusion. When a diagnosis is made, usually by the aid of the roentgen ray, it can readily be appreciated, as Musser pointed out, how essential it is for the surgeon to be perfectly acquainted with the surface markings representing the interlobar fissures. This has been impressed on me in a number of experiences. Lockwood recently reported a case of encapsulated empyaema which I had studied clinically. The pus was encapsulated between the lung and the mediastinum and in the roentgenogram appeared as a unilateral circumscribed mediastinal tumour. The history of inflammatory disease, fever of septic type, leukocytosis, constitutional disability, cough and expectoration, however, pointed to the presence of pus. The expectoration may be very profuse and sudden in onset, simulating abscess when a bronchial fistula is produced. Landis has emphasized the importance of examining the wall of the chest for localized edema and for a sharply circumscribed area of tenderness which suggest the presence of underlying pus. Deep pressure with the finger tips between the ribs proved the only means of clinically localizing an abscess in one recently examined patient who had well developed emphysaema. Because of a deep seated pocket over which the lung is œdematous, or atelectatic, dullness should be present, and the breath sounds variable, according to the degree of consolidation; but they are more often broncho-vesicular because of the presence of air in the alveoli and associated with crepitant, crackling or bubbling râles, depending on the location of moisture in the collapsed and congested overlying lung. The roentgen ray and one or more explorations with the needle serve to establish a diagnosis. If they fail, then exploratory thoracotomy is permissible, or may be obligatory.

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Multiple small abscesses.—The lung tissue in cases of multiple small abscesses, is consolidated and oedematous, and multiple small bronchi leading to the part may be filled with exudate. The physical examination in itself may not give findings materially different from the classical signs which serve to indicate true lobar pneumonia or pseudolobar-bronchopneumonia. In 57 per cent. of Landis' cases the condition followed pneumonia. The remaining cases were due to a large and varied group of infections and suppurative foci in other parts of the body; the aspiration of food is considered as a possible factor. In my experience, this cause has been productive of gangrenous pneumonia whose presence was unmistakable. Its occurrence constitutes a very effective argument for careful supervision of every patient operated on until such time as consciousness returns. An adult may easily aspirate material from his upper respiratory passage when anaesthetized, but does not do so when conscious.

The recognition of multiple abscess is, therefore, difficult, since the tissue is acoustically but little different from that of a pneumonic lung. If the bronchi are closed, the sounds will be distant but will remain bronchial in character. The diagnosis, however, can be suspected, if a septic temperature supervenes, associated with chills, sweats, increasing constitutional disability, anaemia and anorexia, and if the sputum contains elastic tissue. It is not to be expected that the exploring needle can be of much help in solving such a diagnostic problem. The roentgen ray is extremely valuable, unless dense pleura or fluid intervenes.

Unilocular abscess.—The sudden and repeated expectoration of a large amount of yellowish, greenish, or bloody sputum, foul or sweet in odor, becomes the chief basis on which a diagnosis of unilocular abscess is based. Improvement occurs after each emptying of the chest. The findings in physical examination do not materially differ from those of encapsulated empyaema or localized pneumonia, unless the cavity is empty, or the bronchi are closed with secretion. If the bronchi are closed, dullness will be evident over a circumscribed area, and the sounds muffled in character; if the cavity is empty, definite cavity signs will be heard. The roentgen ray confirms the data in the history and the evidence of physical findings. In a few instances, with a proper valuation of history, it may provide evidence sufficient for diagnosis. I have seen several patients whose physical examination failed to reveal the disease, even though its presence was known.

Acute pneumonic tuberculosis.—This disease usually attacks tuberculous persons who have definite apical lesions. The leukocytosis of lobar pneumonia is absent and tuberculosis bacilli are present in the sputum. A long continued upper lobe pneumonia should arouse suspicion.

Pneumococcal empyaema.—Previous to 1918, we were accustomed to suspect the presence of empyaema only several days after the crisis. By then the lung had become air-holding, and the signs first described had taken place. If there was gradual recurrence, fluid was expected. This usually could be determined easily because the sounds produced were necessarily diminished. There was much loss due to reflection between the air-fluid juncture, and the radiation loss was considerable. The replacement of resonance or modified dullness by flatness served as early evidence of the presence of fluid. It is true that there may be considerable fluid in the pleural space before the clinician can demonstrate its presence. It is difficult to discover the presence of less than 500 c.c. clinically, but a smaller amount can be distinguished by fluoroscopic examination. Lord places the amount discoverable clinically at 250c.c. in adults and 100c.c. in children. Landis found experimentally (at necropsy) that 400c.c. of fluid in the adult and 120c.c. in a child of twelve years can be demonstrated by physical signs.

Each of three types of pneumococcal empyaema has its distinctive findings; (1) small effusions, less than 1000 c.c., are usually found high in the back, rarely beyond the posterior axillary line, and displace the lung forward; (2) moderate effusions, between 1000 and 2000c.c., displace the lung forward and upward, and (3) massive effusions, displace the lung into the vertebral gutter. Small effusions do not displace the mediastinum or the liver and affect the intrapleural tension only to a limited degree so that the appearance of the interspaces is not materially altered. Palpation with the finger tips may reveal tenderness and rigidity of the intercostal muscles, but œdema and enlargement of the superficial veins will not be apparent. Moderate effusions, however, produce signs. Garland's triangle of relaxed lung is present; the hyperresonance or tympany of Skoda can be detected above it, and because of an accentuation of the high pitched overtones, egophony appears. If the mediastinum is not already fixed, the heart will be displaced; the diaphragm flattened and the liver rotated downward. Grocco's triangle sometimes can be discovered on the side opposite the effusion. Movable dullness, a pathognomonic sign of effusion, is present only when fluid is free and moderate in amount, and appears only when considerable time has elapsed after postural change. Engelbach and Carman have shown that moderate effusions often appear in encapsulated form and that when fluid has been withdrawn from such lesions, a hydrostatic level is produced, but only within the limits of the encapsulated area. If pneumothorax complicates effusion, as in tuberculous empyaema, rapid movement of the fluid may be expected on postural change; auditory evidence of splash is also a sign. It is well to evaluate the friction rub which advances ahead of the growing effusion. This is most commonly noticed in patients with free empyaema.

In massive effusions the lung has been displaced so that it lies in the vertebral gutter. Resonance then can be detected only in the subclavicular areas or over the upper chest, posteriorly in the interscapular space unless adhesions fix the relaxed lung to the chest wall. The dullness passes across the middle line and merges with that of the displaced heart; the liver is displaced downward; the diaphragm is flattened or even concave and on the left side; and Traube's space is obliterated. Sounds are almost absent because radiation is so great and but little sound enters the lung. Bronchial breathing and bronchophony, however, may be present, because there is but little reflection of sounds from the bronchial wall through the consolidated lung, the effusion, and the chest wall. In such conditions, the negative pressure is replaced by positive, the weight of the fluid (almost always more than 1.018 specific gravity in purulent effusions) contributes to the displacement of organs, especially of the diaphragm and the liver; the interspaces bulge and are often œdematous and there is visible enlargement of the intercostal veins. Often a diagnosis can be surmised by observation alone, as dyspnoea, the use of the extrarespiratory muscles, and the remarkable difference in the respiratory excursion on the two sides are suggestive.

It would seem that several factors may explain why these types first appear, clinically, in the posterior portion of the chest. Engelbach and Carman believe that gravity is the most important of these, and certainly it is a force too little considered. We seldom inquire of the patient the position he has assumed during his illness. This information might be of value in deciding where to insert the exploring needle. Moreover, the shape of the chest itself, the anatomic arrangement of the pleura and the vaulted diaphragm, the elasticity of the lung, which is greatest at the bases, and the negative pressure within the pleural space, all tend to favour the location of free fluid posteriorly and in the dependent position.

Streptococcic empyaema.—In recent years because of streptococcic infection, empyaema has taken on a character different from the pneumococcic type which observes certain well-known rules. The streptococcic type observes none. Miller and Lusk, Brooks and Cecil and many other observers agree that it is the most common complication of the pneumonia following influenza. It cannot be denied that it may exist as a primary pleural suppuration. A study of slides made from the lung tissue of Rosenow's experimental rabbits, demonstrates that the pleura is early and severely infected. Two explanations of the infection are that it is lymph-borne, or that it is the result of small subpleural abscesses, as described. Certainly, the time element cannot be considered as in the pneumococcic disease. The fluid forms with surprising rapidity and, inasmuch as it may precede consolidation, may be superimposed on consolidation, or may succeed pneumonia, the hazard of error is immensely increased. This is more readily understood when one recalls the variable physical signs of resolving pneumonia and that these signs represent the acoustic properties of the underlying tissue. Thus, at least five types of tissue may be represented: (1) distended lung, above and in the opposite side of the chest, (2) relaxed lung, immediately above the fluid level, (3) relaxed but air-holding lung covered by fluid, (4) fluid below the level of the relaxed lung, and (5) consolidated lung covered by fluid.

Montgomery and Eckhardt have described the acoustic properties of these various types of tissue. They find that the proportion of sound loss from reflection is dependent on the differences in density and elasticity of the two mediums, irrespective of whether the sound is passing from the heavier to the lighter or from the lighter to the heavier medium, provided (1) that it passes from one medium to the other at the normal incidence, (2) that plane surfaces come into contact or separate two mediums, and (3) that the two mediums are homogeneous and infinite in extent. Diffusion appears to be the most important factor in reducing the intensity of sound over the chest. Resonance, or tone reinforcement, occurs when vibrations are set up in a second medium and occur in unison, producing a louder sound; interference acts in the opposite manner and causes muffling of certain sounds. It is a discriminating force and explains why vocal resonance may be decreased, and whispered sounds increased over effusion. The studies of Montgomery and Eckhardt explain the clinical facts that; (1) the compressed lung, which conducts sound well above an effusion, produces a broncho-vesicular type of breathing, increased fremitus and resonance, egophony and a tympanitic percussion note; (2) air-bearing lung with fluid superimposed (largely affected by loss from reflection due to passing of a sound through varied types of tissue) produces distant broncho-vesicular breathing, absent or much diminished fremitus, resonance, and a flat percussion note, and (3) solid lung with fluid superimposed (because fluid and solid lung are acoustically similar and the proportion of sound loss from reflection is small) produces sounds resembling those in pneumonia; namely, high pitched, bronchial breath sounds and spoken sounds with decided bronchophonic character. Râles produced in the lung may be heard through fluid. Adhesions holding the lung to the chest wall will increase the intensity of sounds in any of these groups.

Summary. The examiner expects to find sounds absent, but they may be diminished and distant, not dissipated. He may forget that the lung beneath the effusion may be consolidated and is misled by the appearance of definite pneumonic findings. If, after pneumonia, instead of the progressive findings mentioned, the pitch of the percussion note becomes short and elevated, and bronchial breathing becomes nasal in character, one should suspect empyaema and seek the assistance of the roentgen ray or the exploring needle. The organs of the mediastinum are displaced only by moderate and large effusions and even then may be unaffected owing to the formation of adhesions. Their presence in normal locations should not unduly influence judgment.

The examiner should keep in mind the various types of tissue that may be present and this will prevent the discrepancy of the clinical findings from deceiving him by a preconceived notion of what they should be. It should be remembered that in recent years we have been dealing with a less leisurely behaving disease than pneumococcal infection, and that fluid may be superimposed on consolidated lung, or may follow resolution, or may be present very early, before appreciable change appears in the lung. The duration of the disease cannot be trusted as an element in making a diagnosis. A diagnosis of unresolved pneumonia should be made only when every other possibility has been excluded. The roentgen ray should be used freely to confirm any suspicions, and the exploring needle should be employed not only when there is a suspicion of fluid, but when the least doubt exists.

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THE X-RAY FINDINGS IN EMPYAEMA AND ABSCESS OF THE LUNG*

L. R. Hess, M.B.

Hamilton

In directing your attention to the value of the x-ray, and the method of its application in the rather difficult field of purulent infections of the chest, one should first of all point out that this method is really only a highly specialized form of clinical investigation. You will note on reference to the program that the title of this particular section is "X-Ray Findings." This is as it should be, because we can no more separate the x-ray examination from the clinical diagnosis than we can separate auscultation, as one particular method, from percussion, as another. The x-ray is a somewhat elaborate refinement of the simpler, and, shall we say, less direct methods, which were the only ones formerly available.

The chest lends itself peculiarly well to x-ray study, the clear air-filled lung showing up in contrast against the relatively opaque outline of the spine and chest cage and sharply defined, movable diaphragm, on the one hand, and the heart and great vessels, on the other. In this way, even minute alterations of the normal densities of the lungs, or pleurae, can be easily seen. It may be laid down as an axiom that any gross pathology in lung tissue, any abnormal thickening of the pleura, or any accumulation of fluid, whether free in the pleural cavity, or encapsulated within the lung itself, casts a characteristic shadow on the x-ray plate or screen. The interpretation of these abnormal shadow-densities, characteristic as they are of the pathology producing them, will afford the clinician great assistance in his diagnosis both of empyaema and lung abscess. Attention should be drawn to the uncertainty which often exists in the diagnosis of these two conditions in cases in which one has to depend alone on symptoms and physical signs. The certainty of the x-ray findings and the characteristic appearance of the shadows often enables the radiologist to clear up the diagnosis in doubtful cases at an early stage, before positive physical signs are present. The method, however, is not without its difficulties and its pitfalls for the untrained observer. The so-called "ring-shadows," so frequently seen, or the shadow of a large bronchus seen in cross section, may simulate a cavity. Calcification of costal cartilages, the pendulous breast, or the shadow of a prominent nipple in contact with the plate, have each of them at times, led to errors of interpretation. But here, as in all other methods the errors are those either of improper technique, or of faulty observation.

Lung Abscess. The characteristic appearance of a lung abscess on the x-ray plate is that of a more or less spherical density, occurring within one of the pulmonary lobes. The stereoscopic method is here of the greatest value in localizing this density since an estimation of the third dimension is necessary. It is usually not possible to distinguish between abscesses occurring in bronchiectasis and those developing from a breaking down of the lung tissue. Two essential pathological conditions are present in lung abscess; a localized infiltration or consolidation of lung tissue, embedded in which are one or more cavities filled with pus. In addition, therefore, to the demonstration of the more or less discreet abscess cavity, we have a surrounding halo due to the shadow of this infiltrated tissue. If free air exists in the cavity itself, its demonstration is unmistakable from the horizontal fluid level. Occasionally, when the abscess cannot be otherwise definitely shown, this shifting horizontal line of fluid level becomes diagnostic. By its means also not only the width of the cavity, from side to side, but its vertical diameter may be shown by a change of posture to the horizontal. Often a cavity in which the exact outline is indistinguishable from the surrounding infiltrated area may be demonstrated at a later examination, or after expectoration. Even the smallest evidence of horizontal fluid level is definite proof of an abscess cavity. The differential diagnosis of lung abscess from localized tuberculosis may be difficult. Infiltration in a lower lobe, with no involvement of the apex, is probably not tuberculous; but in a case with infiltration of an upper lobe, and in the absence of fluid levels, it may be impossible to distinguish the two conditions. Dense tuberculous infiltration is usually accompanied by coarse fibrosis, running to the hilum, and is often accompanied by calcareous deposits. Tuberculous cavities, as a rule, contain no fluid, they occur usually in the upper lobe, and are not common in the lower. Tuberculous cavities, which contain fluid, are usually secondarily infected and may be regarded as abscess cavities.

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The x-ray examination is an essential preliminary to operation in all cases. It determines the location of the abscess, and on its extent will depend the type of operation to be performed. The exact route of surgical approach will naturally depend on the location of the abscess with reference to the chest wall. A practical point in this connection is the making of landmarks on the patient's chest with indelible pencil, after screen localization, giving the surgeon his exact depth and direction by surface markings.

The *modus operandi* of this localization will vary with the radiologist. The simplest method is to locate two marks, one on the anterior surface of the chest wall, and the other in a line with the centre of the abscess on the posterior chest wall, using for this purpose any metal instrument, preferably the handle of a long dressing forceps. The abscess will then lie in the line joining these two points. By examination with the patient in the lateral position, a third point is located on the lateral chest wall, at the nearest point of the abscess to the skin surface. The depth beneath this point can then be estimated by a further observation in the antero-posterior direction, and reported.

Empyaema. The characteristic appearance of fluid in the pleural cavity depends largely on its quantity, and on the presence or absence of adhesions. In referring here to fluid, I do so without reference to whether or not it is purulent, since there is no differentiation from the x-ray standpoint between the various types of effusion. The appearance of a simple pleural effusion is that of a dense shadow extending upward from the diaphragm on the affected side, and with an irregular upper surface usually concave above. The amount of fluid present, of course, determines the relative size of this shadow. In the beginning of effusions, the shadow will often be seen to extend upward on the parietal pleura before extending across the diaphragm at the base. One of the earliest and most constant x-ray signs of free fluid in the pleural cavity, unaccompanied by pneumothorax, is the obliteration of the costo-phrenic angle. When the effusion is but slight it can be readily seen by comparison with the angle on the opposite side. As a diagnostic sign this is of value because the triangular portion of lung, which fits this space, rarely has its cells obliterated by a lesion of intrapulmonary origin. As the effusion increases, the distinctive concave upper border disappears until finally the entire lung field is occupied by a uniform consistent density which completely obliterates the lung markings, and is associated with a displacement, more or less marked, of the entire mediastinal contents towards the opposite side. This sign is more marked in adults than in children.

I would like at this point to emphasize the great value of serial, or frequently repeated x-ray examinations, to determine the progress of the case. When no free air is present with the effusion, very slight change can be noted in the relative shape and position of the shadow on change of posture, and especially in early effusions in children, even the inverted posture will fail to cause any change in the outline of the fluid shadow. If adhesions are present, and are sufficiently extensive, the effusion may become encapsulated, and the shadow then appears of more or less spherical form, encroaching on the lung field, the base of the shadow corresponding to the chest wall. In these cases, again, as in lung abscess, the exact limits of the effusion can best be determined by lateral or oblique examination, or by stereoscopy. Much difficulty in interpretation will be encountered in those chronic cases in which great pleural thickening has occurred, accompanied by adhesions. The author's greatest difficulty has been in cases where a former operation had been done for drainage. In many of these the pleura is extremely dense, and the normal appearance so altered and distorted by adhesions, that it is only with the greatest difficulty that the amount and location of retained or encapsulated effusion can be estimated. A patient who has suffered from a former empyæma may have the pleura so thickened as to cast a shadow similar to that of a massive effusion.

Reference should be made, also, to interlobar pleurisy, with effusion, which may become purulent and encapsulated. Interlobar empyæma is not common. As a rule, it occurs in the right upper interlobar fissure, and may exist independently, or as part of an encapsulated empyæma of the general pleural cavity. The x-ray appearance is characteristic, being a dense, almost horizontal band crossing the lung field in the neighborhood of the interlobar fissure, wider towards the periphery. Here, the oblique projection is of value. The symptoms and physical signs are as notoriously uncertain as in lung abscess, but the x-ray findings are usually definite.

The most striking and characteristic x-ray appearance of either empyæma or lung abscess occurs when free air has been introduced. There may be seen then the horizontal fluid level, changing its position with every change of posture, and in constant movement on the fluoroscope screen with every respiration. This is especially well seen in the large purulent effusion with free air above it met with in pyo-pneumothorax.

After operation, x-ray observation of the drainage either of empyæma or of abscess cavities, is very valuable, for by no other method can the surgeon so well determine whether or not he has secured efficient drainage. Several examinations at short intervals will indicate the continuance of drainage, and the obliteration of the dead space.

In the old chronic empyæma case with discharging sinuses, in addition to the routine examination, valuable information may be obtained by examination following the introduction of bismuth paste. The technique can only briefly be referred to, and consists in the injection, with carefully controlled syringe pressure, of a 25% suspension of bismuth subnitrate in vaseline. Stereoscopic plates, made following this, show the ramifications of fistulous tracts, and the exact extent and location of persistent cavities.

REMARKS ON DEFICIENCY DISEASES

F. H. Wetmore, M.D.

Hampton, N.B.

STIMULATED by the discovery during the war of so many unfit C3 men, there arose a widespread movement to better the physical condition of the human race. Of first importance in such an endeavour is the practical application to every-day life of our newer knowledge concerning nutrition. The profession are beginning to realize that dietetic habits need remodelling; the public should be taught not only what to eat but the reasons for discrimination in the character of their diet.

McCollum[1] and others by numerous biological experiments have discovered:—(1) That the chemical requirements of all the higher animals, including man, are the same; a diet faulty in its constituents which will produce symptoms of malnutrition in one species, will cause similar symptoms in another species; (2) That for the avoidance of abnormal symptoms a dietary must be well balanced; there must be a due proportion of protein, carbohydrates, fats and mineral salts; (3) That proteins chemically similar may not have the same food value; the proteins of the glandular organs (e.g. liver, kidney, etc.) have a peculiar food value, which is lacking in the protein of muscular tissues; (4) That besides the protein, there are in foods certain substances, named by Funk, vitamins, not yet chemically defined, but essential nevertheless for proper growth and development, and for the maintenance of good health. These substances are destroyed by the high temperatures used in cooking food. Food without vitamins is dead food and animals fed upon it suffer from malnutrition and finally die. Let it be understood then, that neither a well-balanced diet deficient in vitamins, nor food containing vitamins and not well balanced can support life. For the best health the two conditions must be fulfilled. The vitamins discovered and studied up to the present time are (1) fat soluble vitamin A, (2) water soluble vitamin B, and (3) water soluble vitamin C. Charts prepared from McCarrison's[2] writings show the foods rich in these vitamins. (Tables shown below.)

The saying, "The worth of a thing is best known by the want of it" is well exemplified in the case of vitamins. McCarrison has developed the idea that it is not the eating of wrong foods alone or principally, but the absence of proper foods from our dietary that constitutes a danger.

The absence from the diet of foods containing vitamin B is the cause of the beri-beri of eastern countries where the food consists chiefly of polished rice, and frequently fish, eggs and leafy vegetables are not added in sufficient amount. It is readily cured by administering the husks of the rice including the rice germ, removed during the process of polishing. A similar disease called avian polyneuritis is produced in pigeons by feeding rice that has been superheated. The functional inco-ordination of the pigeon's cerebellum is cured within 24 hours by the administration of one dose of vitamin extract made by McCarrison from egg-yolk.

The absence from the diet of foods containing fat soluble vitamin A, such as whole milk, butter and animal fats, is the cause of a disease of the eyes liable to end in blindness owing to ulceration of the cornea; it was noticed in Denmark during the war, and is readily produced experimentally in rats. It is easily cured by supplying the necessary food. There is a strong probability also that it is the absence of foods containing vitamins from the diet of the mother, or prospective mother, that induces the development of rickets.[3]

The absence from the diet of foods containing water soluble vitamin C, fruits and leafy vegetables is, as you all know, the cause of scurvy; scorbutic symptoms, and symptoms of latent scurvy, which, we are informed by Hess,[4] are frequently met with in infants, and call for the administration of orange, tomato or prune juice for preventive and curative purposes.

A fifth fact brought out by different investigators is one of startling significance to us as general practitioners and to the world in general, namely, that because of an ill-balanced dietary, lacking in vitamins, animals may become sterile, or their offspring may be still born, or so weakly that they die soon after birth. McCarrison shows that with a deficient diet, the reproductive organs are the first to atrophy. Because of these various facts prospective and nursing mothers should be advised to partake freely of milk, fruit and leafy vegetables, McCollum's protective foods. The Board of Health authorities should make practical application of this knowledge in their pre-natal and baby-clinics. Here let me remark how closely preventive medicine, and medical practice are drawing together, especially that branch of preventive medicine that has to do with increasing and developing the resisting power of the individual.

McCarrison makes a much wider application of the term deficiency disease. He experimented on 400 pigeons and 36 monkeys besides guinea pigs with foods ill-balanced and lacking in one or more of the vitamins. After death he weighed the organs and examined them histologically. He states that polyneuritis of the pigeon, and the pronounced condition of ill-health of the monkey with its emaciation and increasing involvement of the nervous system are end results of long continued faulty diets. The pigeon's diet was lacking in vitamin B.; the diet of the monkey was sufficient chemically, but being autoclaved, or over heated, it was entirely lacking in vitamins A and B, vitamin C being supplied by raw onion. But, and here is the important point, long before these extreme stages were reached, the animals suffered from many disorders, most prominent among which were disorders of the gastro-intestinal system, due as McCarrison says to the absence of vitamin B. These various disorders were "distaste for food, loss of appetite or depraved appetite, gastro-intestinal derangements, indigestion, colitis, diarrhoea, loss of weight, weakness and lack of vigor, headache, anaemia, tendency to œdema, and unhealthy skin; also sub-normal temperature, and cardio-vascular depression." Finally there was involvement of the nervous system as shown by wrist drop in monkey. It is to be noted that the early manifestations of these disorders, due to a diet ill-balanced, and lacking in vitamin B are susceptible of cure by correcting the diet; a few doses of McCarrison's vitamin extract cured the pigeon of diarrhoea, as readily as it would cure the polyneuritis.

Let us apply this idea to the consideration of human ailments. To quote McCarrison; "Although the food usually partaken of by human beings, is seldom entirely lacking in any one vitamin, it is frequent to meet with a partial deficiency in one or more of the vitamines; and it is quite common for deficiency in the vitamins to be associated with a deficiency of suitable proteins and inorganic salts, with an excessive quantity of carbohydrates." Any one of us on systematic enquiry can readily verify this statement. The numerous cases of gastro-intestinal disorders, and the various forms of vague ill-health, that constitute at least 25 per cent. of all cases applying to us for relief, have their origin in faulty diet, says McCarrison, and are best treated by correcting the same, and it is to this group of ailments that he applies the term Deficiency Disease.

How often do we find individuals, particularly the young, with attacks of indigestion, vomiting, with or without abdominal pain, from some indiscretion in diet, such indiscretion being an excess of carbo-hydrates in the form of sweets, or an excess of fat in the form of butter and cream or an ill-balanced diet, with, you will find on enquiry, a long continued deficiency of foods containing vitamin B. A more liberal supply of vitamin B in the child's diet such as is found in whole wheat bread, or in the glandular organs, together with milk, and fruit and leafy vegetables, would probably have protected him from a disordered digestion. And how successfully now do we treat many cases of apparently beginning, or real gastric or duodenal ulcer, with shredded wheat biscuit or whole wheat bread, and milk, all containing vitamin B, along with some simple alkali as soda or bismuth. On enquiry of such a patient, you will find that for a longer or shorter time, weeks, months, or perhaps years, (in a case of colitis possibly from his youth up) his diet has been deficient in vitamin B.

Late last spring I was asked to see a male adult, with other organs sound, who had been suffering for some days with quite severe abdominal pain, that kept him from sleeping, and that was accompanied by mental depression. There was a tender pressure point one or two inches to the left of the umbilicus, and another the same distance above. His diet during the winter and spring was composed of white bread, cereals, potatoes, some cake and tea, with practically no milk and no fruit or fresh vegetables, a diet certainly deficient in vitamins. During the several days of pain, he had been given a great variety of drugs, and allowed as liquid food, broths and meat extracts, which his stomach promptly rejected. The lack of vitamin B caused his illness and kept him ill. Milk and an alkali without other medication, beyond application of an icebag stopped the pain at once, and allowed him to sleep the first day of treatment. With shredded wheat biscuit and whole wheat bread and raw eggs added to this diet, his mental condition as well as his physical was soon restored.

Some of the gastro-intestinal disorders, due to individuals partaking for a longer or shorter period of a diet faulty in the way I have mentioned are infantile diarrhoea, gaol dysentery, gastric and duodenal ulcers, colitis and chronic intestinal stasis. A deficient diet is probably a principal cause in many of the gastro-intestinal disorders met with. to which undoubtedly frequently is super-added invasion by pathogenic bacteria. No doubt many cases are also influenced by some abnormality of the endocrine system, but that abnormality also may be caused by a deficient diet. Some of the conditions with which the surgeon is asked to deal are end-results of a deficient dietary. His gastro-enterostomies and his appendectomies also might yield better results if more attention were paid after operation to the patient's dietary. In contrast to the work of the surgeon, it is the province of ourselves as general practitioners to watch for the beginnings of morbidity in the intestinal tract, and so prevent these end-results. To do so, it is necessary for us to inform ourselves concerning the foods which are rich, less rich or lacking in the respective vitamins, and also to acquaint ourselves with the symptoms due to relative absence from the diet of one or more of these vitamins. By acquiring such knowledge and systematically applying it in our daily practice, we will best rid ourselves of the stigma of Byron's poetic line "The doctor quacks us."

Foods Rich in Vitamin A.

Raw milk; animal fats, such as butter, cream, crude cod liver oil; egg-yolk; animal glandular organs, liver, heart, kidneys, salmon, herring and other fat fish. Vegetables, such as green leaves and growing parts of plants, spinach, lettuce, cabbage and brussels sprouts; tomatoes.

Foods Rich in Vitamin B.

Germs of seeds; wheat and rice brans, whole wheat bread, yeast. Green vegetables, such as cabbage, lettuce, spinach, peas and beans. Eggs. Cellular organs, such as liver, brain, sweetbread, fish roe, kidney and muscles of the heart. Fruits; bananas, oranges, lemon juice and tomatoes. Nuts, such as almonds, walnuts, filberts, brazil nuts, chestnuts and hickory.

Foods Rich in Vitamin C.

(One gram of Lemon Juice being taken as 100)

Fresh lemon juice (raw)	100
" orange " "	100
Ripe onion	100
Fresh cabbage juice (raw)	60
" " leaves (cooked at 100 C. for 20 min.)	30
" " " (cooked at 70-80 C. for 60 min.)	10
" tomato juice (raw)	60
" turnip " "	30
" green beans	30

The bulk of our food is composed of seed products, tubers, roots, and meats. A well balanced diet contains about equal parts of protein and fat with three or four times as much carbohydrates besides mineral salts and water. Our dietary should contain as well the following in order to ensure an adequate supply of:

Vitamin A.	*Vitamin B.*	*Vitamin C.*
Whole milk	Whole bread	
Butter	or nuts	
Animal fats		
Eggs	Eggs	
Glandular organs	Glandular organs	
Fresh fruits	Fresh fruits	Fresh fruits
Green vegetables	Green vegetables	Green vegetables

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SOME OBSERVATIONS ON THE SURGERY OF DUODENAL MEMBRANES, WITH A CALL-IN-REPORT OF RESULTS OF TREATMENT

R. P. Cromarty, B.A., M.Sc., M.B.,

Brandon, Man.

DURING operations performed for the relief of stasis due to bands on the colon, terminal ileum, etc., a condition of membranes on the duodenum has been observed in a large number of cases. They have been treated surgically in forty cases at the Bigelow Clinic in the last two and a half years. They are so frequent that it has been considered wise to investigate the effects they have, and the part they play in the picture of intestinal stasis.

The different types of duodenal membranes referred to range all the way from sheets closely overlying the duodenum and fixed at the omental and mesocolic attachments, to dense cord-like bars from the liver or colon, spreading out over the duodenum. The latter have frequently caused distinct constriction of the duodenum, while the first always tend to cause longitudinal puckering of the duodenal wall, and consequent interference with its proper muscular function and disturbance of its outline.

Certain cases, as yet few in number, were diagnosed as having no other pathology, and, at operation, nothing was found except the above type of membranes. The results of surgical treatment of these are both gratifying and important. These cases had always been treated for a long time by medical means before surgical procedure was considered advisable. And it is still difficult to decide whether a particular case demands operation for this condition alone. But the importance of removing the duodenal membranes as a part of the work in operation upon colon bands cannot be overestimated. They are a proved cause of failure to get relief in some cases where they have been missed and bands on the caecum and ileum alone attended to. Search for the cause of failure of simple appendicectomy or cholecystectomy in chronic cases, especially with so-called reflex pain high up, has stimulated thorough examination and resulted in blame being laid on these membranes in many cases

Duodenal membranes are frequently present in cases of cholecystitis. These may or may not be attached to the gall-bladder, and it is then difficult to allocate the symptoms due to the different pathological lesions. But a consideration of many cases and of the results of treatment demonstrates very definite symptoms as due to the membranes on the duodenum.

Analysis of Cases.—In order of frequency, the commonest symptoms in operated cases of duodenal membranes are: (1) Gnawing or cramping pain in the epigastrium, 75 per cent.; (2) Tenderness in the epigastrium, 56 per cent.; (3) Eructations of gas, 50 per cent.; (4) Nausea or vomiting, 42 per cent. Seventy per cent. of the cases had good (often excessive) appetites, and hyperacidity in the gastric content. It is evident that in many respects these findings are similar to those in duodenal ulcer. But there is one great point of difference, namely, that the pain in ulcer is very definitely related to ingestion of food, whereas in cases of duodenal membranes, the pain tends to be very persistent, pulling and gnawing in type, and is not influenced for the better by taking food. It is easy to picture the reason for the difference. In ulcer the bowel may be free and will depend for its pathological stimulus on distension or irritation from within. In cases of membranes, the bowel is influenced from without by the constant pressure of the membrane. Hence the pain is more persistent, and is liable to be made worse by taking food which apparently increases the mechanical effect by temporarily pressing the duodenum against its constricting membranes. Jarring and lifting also increase the pain. The tenderness in membrane cases is also liable to be persistent, while in ulcer it is extremely variable, according to the degree of invasion of the bowel wall by the ulcer. These points alone would help to make the diagnosis in cases where ulcer could be eliminated, even if we could not depend on the *x*-ray for accurate diagnosis of membranes.

Cholecystitis, on the other hand, probably the most fruitful source of formation and eructation of gas, is quite easily differentiated by the location of the pain, not to mention the other evidences of inflammation and biliary disturbance characteristic of gall-bladder disease. As with the pain and tenderness, the skin reflex point for the duodenum gives a positive reaction in the cases of duodenal membranes, whereas in cholecystitis this point is displaced to the right to the characteristic gall-bladder area.[1]

In some distinctive cases in which the duodenal membranes were the only evident pathology, epigastric pain and tenderness, with belching of gas, were marked symptoms in each. Questionaires have shown all these cases much improved in general state, and particularly were they greatly relieved of the epigastric pain and tenderness. These results were all the more satisfying in view of the failure of persistent medical treatment to give relief to anything like the extent it habitually does in duodenal ulcer.

The final diagnosis in all our cases has been supplied by the x-ray examination with the fluoroscope by Dr. Carter.[2] The fluoroscopic findings have necessarily varied according to the location of the lesions In some the duodenal cap appears to have been sheared off on one surface as by a pair of scissors It will not fill properly with barium, yet the filling defect is frequently smooth and regular, and there are not acute indentations such as are commonly found in ulcer. The cap is frequently spastic and only fills normally under much pressure In other cases the cap and first part of the duodenum are drawn vertically upward out of their normal location. In still others the second part of the duodenum is drawn upward and to the right, often to a considerable distance from its normal location. The findings are clearly due to mechanical interference with the bowel, so that their discovery depends on long familiarity with the normal *x*-ray appearance and location of the duodenum Frequently the second part of the duodenum appears overvisualized. This in itself is not diagnostic of duodenal membranes. It may, of course, indicate obstruction below in the mesocolon or duodenal banding above with resultant paresis in the second part.

Etiology.—With the establishment of the duodenal membranes as a frequently occurring pathological entity comes the question of their origin. Are they bands in the same sense as the bands which occur so frequently on the cæcum and ascending colon? Or are they adhesions and therefore a result of trauma or of inflammation from gall-bladder, previous duodenal ulcer, localized peritonitis, etc.? Of two of the three types there is very little doubt, namely, those which extend as cord-like structures from the liver to the duodenum and those which drag the great omentum up over the transverse colon toward their upper attachment on the duodenum. These two appear to be inflammatory in origin. Their structure shows that they have been put under tension as they contracted towards the end of the process of organization. They often resemble the string-like adhesions between coils of bowel, which have at times caused intestinal obstruction. Of the other type such dogmatic statements cannot be made. If they were attached locally to any particular point on the duodenum they might be suspected of being due either to localized inflammation, or to previous ulceration. But they are usually thin even sheets which can be layered off the peritoneum easily, and are not fixed, except beyond the bowel at least on one side. The puckering they produce resembles a similar finding in a banded cæcum. On the other hand, their structure suggests the reaction of an inflammation around the duodenum. Our opinion is that they are usually inflammatory.

Operative Techique.—The surgical treatment of duodenal membranes requires an incision similar to that favored for a cholecystectomy. A free exposure of the duodenum must be obtained. If the membranes are fibrous or cord-like, they are cut parallel to the duodenum through the avascular parts, occasionally trimmed, and allowed to retract after ligating any small bleeding points. If they are closely applied to the duodenum they must be carefully lifted up from its surface with dissecting forceps and scissors, and cut without damaging the peritoneal covering. There is usually very little hæmorrhage. If the dissection leads down to any large vessels it is a signal to stop and avoid damage to omental or mesocolic structures. During this process the duodenum is often seen to actually roll out and appear much more nearly normal, though it has been in no way loosened from its attachments to the lesser omentum, mesocolon, etc., and though nothing but abnormal tissue has been cut. After the peritoneal coat of the duodenum has been completely cleared of all abnormal membrane, it is covered over with a thin complete layer of sterile vaseline and the adjacent structures allowed to fall into normal relation with it again.

The question is suggested, "What percentage of these cases show recurrences?" It is rather early to fully answer this question. So far the relief obtained has been continued. They should behave in a way similar to the cæcum after cutting its bands, and recurrence has been rare in these cases.

RESULTS:

The results have been investigated by sending a questionnaire to each patient. The following information is taken directly from this source. These answers apply only to operated cases.

1.—Symptoms as a whole: Much improved, 80 per cent.; slightly, 15 per cent.

2.—Epigastric pain: Present, 61 per cent.; cured, 33 per cent.; relieved, 55 per cent.

3.—Belching gas: Present, 61 per cent.; improved, 55 per cent.

4.—Epigastric tenderness: Present, 50 per cent.; cured, 57 per cent.; relieved, 29 per cent.

5.—Nausea and vomiting: Present, 30 per cent.; relieved, 80 per cent.

It will be noted that even here where many of the cases are combinations of duodenal membranes with other conditions, the relief of epigastric pain and tenderness are very marked, and compare favourably with the cases mentioned above of uncomplicated duodenal membranes. In going over the records it is noticeable that nearly all these cases have been repeatedly re-examined by the various methods. Some were at first diagnosed as a neurosis, or as chronic appendicitis with reflex spasm of the stomach, etc. Medical treatment was of no avail, and surgical interference was needed to relieve the mechanical difficulties of the situation.

The following is the record of a typical case: No. 6608—Patient complains of gnawing pain in the pit of the stomach all the time, with tenderness over the painful area; even pressure of the clothing hurts the epigastrium. Riding over rough ground increases the soreness. There was some nausea at meal time. These symptoms have been present for three years. There was some soreness in the right lumbar region on exertion. He could not work on account of the pain, tenderness and weakness, all of which got worse in the last three weeks. Appendicectomy had been done three years previously. His subjective symptoms show shortness of breath, good appetite, some belching of gas and regular bowel movements. Nausea, with one or two vomiting spells lately.

Physical examination shows—B. P. 130-90; pulse 88, regular; heart and lungs normal; abdomen, low right rectus scar, small area of tenderness one and a half inch above and just to right of umbilicus

Fluoroscopy of stomach is normal except for hyperperistalsis; duodenal cap small and flattened in all positions; stomach empty in five hours. In eight hours the ileum was nearly empty; head of meal at splenic flexure; ileo-cæcal region mobile and tender (slightly). In twenty-four hours colons filled normally; butt of cæcum non-mobile and quite tender. Greatest tenderness in the gall-bladder and duodenal area. After barium enema—colons fill normally; slight band at butt of caecum. This area is mobile and slightly tender. Urinalysis—Specific gravity 1,020; alkaline, negative. · Test meal—Amount 52 cc; free HCl 47; total 78. Blood—Hb 80; R.B.C. 5,230,000; W.B.C. 8.900.

Operative Findings:—Dense masses of membranes over first part of duodenum; gall-bladder free and emptied easily; caecum was free and appendix absent; small adhesions of omentum to old scar. Result—Symptoms much improved; pain greatly relieved; tenderness and vomiting cured entirely; belching of gas and nausea much relieved.

Note:—The gall bladder was not removed in this case or in any case referred to in this paper.

CONCLUSION

In conclusion, comparison of symptoms and operative findings with results shows consistently that in the absence of epigastric pain and tenderness surgical removal of the duodenal membranes gave the poorest results in the series. When the characteristic complaints were present the results were always good. The importance of thorough examination by all means in our power, especially in the cases habitually named chronic appendicitis, is again confirmed. This symptom complex backed up by fluoroscopic findings appears to establish the entity of duodenal membranes and the fact that surgical measures are justified.

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TREATMENT OF PROSTATISM*

THE DEPARTMENT OF UROLOGY, ROYAL VICTORIA HOSPITAL

DAVID W. MACKENZIE, M.D., F.A.C.S. AND MAGNUS I. SENG, M.D.

Montreal

THE purpose of this paper is neither to draw comparisons between the various methods of performing prostatectomy nor to laud any particular method to the exclusion of all others but rather to bring before you some of our efforts to simplify the treatment of this common condition.

Each method has, at the proper time and in the proper hands, its own peculiar virtues and uses, and in a well-equipped department of urology, with an efficiently trained personnel, such as they have in the large hospitals of to-day, no one method of dealing with the question of prostatectomy should be adhered to to the exclusion of all others. We have come to realize in our teaching, both under-graduate and graduate, that the exigencies of general medical or surgical practice do not allow the time or afford the opportunity for mastering the techniques of the various methods of performing prostatectomy.

With this in mind we have attempted in the past few years in the Department of Urology of the Royal Victoria Hospital to perfect, and above all to simplify a method of prostatectomy which will give the safest and most satisfactory results. The operation that fulfils the three requisites of simplicity in management, ease and safety in performance, and satisfaction in the final result is, we believe, the so-called two stage suprapubic prostatectomy. Below will be described the routine, technique, and management used in this class of cases in the Department of Urology in the Royal Victoria Hospital.

On admission to the Department a searching history is taken with particular elaboration of the symptoms referable to the genito-urinary system. These symptoms are frequency, dysuria, hæmaturia, and alteration of the urinary stream. The frequency of urination may be day or night; more often it is nocturnal. Frequency was noted in 90 per cent. of our cases and it formed the first symptoms noted by the patient in 78 per cent. of the cases. Painful urination is at times a prominent symptom. Contrary to the almost universal belief, hæmaturia is not so prominent a symptom in carcinoma of the prostate as it is in prostatism, the benign prostate. This is caused by the congestion and erosion of the prostate and vesical neck in prostatism.

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A prominent symptom, nearly always, is alteration of the urinary stream. The patient notices that for some months or even years the urinary stream has gradually become smaller and that he has to strain to start his flow. He has also since this began, become the victim of hæmorrhoids or hernia. This condition continues until one day after a chill or after some indisposition he is unable to void at all. He has his first attack of retention and he requires to be catheterized. He may recover and he may have several such attacks, all of which he survives. But sooner or later he will not recover.

Always there is close questioning of the patient regarding his general health, appetite, sleep, headaches, constipation, bad taste in the mouth and dry tongue, torpor, loss of weight and strength; all pointing to a general intoxication due to impaired renal function. The onset of symptoms varies considerably. Usually it is over a long period of time. The average onset of symptoms before admission, in our series, was 5½ years, the longest 32 years. It may be quite short, especially in the early cases.

Next a complete physical examination is made to include exploration of the urethra, determination of prostatic obstruction, amount of residual urine, and estimation of the extent of prostatic involvement, per rectum. Not unimportant is the estimation of the blood pressure, which not infrequently is quite high and falls 20 to 30 millimeters of mercury upon relief of retention. Repeated urinalyses are done: 90 per cent of these cases of prostatism show the presence of infection by pus and blood in the microscopic specimen, often the specific gravity is low.

Then comes the repeated estimation of the renal function by the phenolsulphonephthalein test:

	Percentage
Normal average: first hour reading	50 to 60
Normal average: second hour reading ..	25 to 30
Normal average: Two-hour reading	75 to 85

In cases of prostatism our findings have been:

	Percentage
On admission average two hour reading	35
After drainage average two hour reading ...	52
On discharge average two hour reading	57

The urea, uric acid, and creatinine contents of the blood are taken at intervals coincident with the estimation of the phenolsulphonephthalein tests. The findings here, for the most part, parallel those of the latter. The normal contents of the blood may be said to be:

Blood urea	0.35 grammes per litre of blood.
Blood urea nitrogen ..	12 to 18 milligrams per 100 cubic centimeters of blood.
Uric Acid	1.5 to 3.5 milligrams per 100 cubic centimeters of blood.
Creatinine	0.7 to 1.5 milligrams per 100 cubic centimeters of blood.

Blood findings in cases of prostatism:

	Percentage
Cases showing only blood urea retention	46
Cases showing blood urea and uric acid retention	24
Cases showing blood urea, uric acid and creatinine retention	40
Cases showing normal blood urea, uric acid and creatinine content	26

The blood urea is the first element of the blood to be affected, followed by uric acid, with creatinine the last to be elevated above normal limits; when this last occurs it is an indication of a severe degree of impaired renal function and indicates a poor or at least guarded prognosis. This is particularly true when the creatinine content remains fixed or moves but little towards the normal limit, even after prolonged catheter or suprapubic drainage. The phthalein test is the simpler and gives a quite satisfactory indication of the functional condition of the kidneys. Just here it is well to state that though we consider the laboratory findings of prime importance, not less do we estimate the clinical and physical condition of the patient. Each must supplement the other, else the surgeon finds he is going astray.

Every case is roentgenographed for the presence of stone, vesical or renal. Cystoscopy is performed in selected cases to determine or verify presence of stone, extent of intravesical enlargement of the prostate, and presence of vesical diverticula.

Should there be residual urine, which occurs in 30 per cent of the cases, either an indwelling catheter is placed in the urethra, when tolerated, or the patient is catheterized every 8 hours until such time as suprapubic cystotomy is performed. The average drainage in this manner has been 5 days. However, suprapubic drainage can be done at any time, the sooner the better. It is freer than catheter drainage and less likely to go wrong or lead to the annoying complication of epididymitis.

The suprapubic cystotomy: Our routine wash-up has been soap, water and alcohol. The bladder is filled comfortably with warm boric solution or distilled water. Local anaesthesia, anocain 1 per cent. or novocaine 1 per cent. for the skin, and ½ per cent. for the deep tissues, is used. Infiltration is done slowly, care being taken that there is no pain or shock. The virtue of the local anaesthesia is that it can be done leisurely; there is no strain on the already much overworked kidneys. Infiltration can be done with the patient anywhere, in his bed or on the kitchen table. The skin and deeper tissues are infiltrated from just below the umbilicus to well onto the symphysis pubis. A median suprapubic incision is made along the line of infiltration. This gives a long incision and it is purposely so, so that we may see and handle easily those structures we have to deal with. The rectus sheath is incised practically the length of the incision; the recti are separated and retracted. The peritoneal fold with its layer of pre-peritoneal fat is infiltrated just at the symphysis pubis, and by careful dissection is retracted upward. Not infrequently this fold of peritoneum is low and may be adherent to the pubic bone, which brings forcibly to mind the folly of suprapubic puncture with trocar and cannula. The fold is retracted as high as possible, during which the bladder becomes exposed. The bladder is infiltrated at its highest point, incised, and the contents evacuated by suction, and then explored for calculi, and to determine the exact size of the gland and nature of the obstruction. At this point we have been in the habit of putting in what is called an "anchoring suture," heavy catgut on a fair-sized curved needle is used. The suture is placed at the level of the vault of the bladder and goes through the rectum fascia and the rectus muscle of one side, takes a firm bite into the musculature of the bladder at the vault, and comes out through the rectus muscle and rectus fascia of the opposite side, at the corresponding level. This suture is tied later and anchors the bladder securely to the anterior abdominal wall, thus preventing herniation of the peritoneal fold into the wound. Next is the insertion of the so-called Pezzer catheter No. F 36 or whatever size is thought advisable: If necessary the bladder is sutured firmly about the tube which is drawn snugly against the vault of the bladder so that the "mushroom" fits firmly against the bladder wall. Before closure proper drainage of this tube is seen to. Closure of the wound is by catgut suture for muscle and fascia. Before the skin sutures are placed the "anchoring suture" above mentioned, is securely tied. A prevesical drain of iodoform gauze or cigarette drain is placed in the space of Retzius. Skin closure is with silkworm by mattress suture. The wound is dressed.

Post-operative care following cystotomy: Dressing of the wound with alcohol dressings; through the suprapubic tube the bladder is irrigated daily with mild antiseptic solution, as boric, or if there is much pus and mucus 1:10000 silver nitrate solution is used. If the urine has been alkaline, encrustation of the drainage tube may take place, this is obviated by the daily bladder irrigations and by rendering the urine acid by the administration of acid sodium phosphate solution aud urotropin. In case there is encrustation of the tube with urinary salts, which might occur in 4 to 6 days, and the drainage is not sufficiently free, the tube is removed, cleaned, sterilized, reinserted, or an "L" tube is put in instead; either is easily inserted, as a firm sinus has by this time formed. Sometimes the tube is not reinserted, should the patient be in proper condition for prostatectomy in a day or two. Nearly always the tube need not be removed; in fact, it may remain comfortably in situ for months, if necessary, with proper care.

We have abandoned the continuous irrigation and the syphon drainage. The Pezzer catheter drains into a urinal or a wide-necked 8 ounce bottle. This drainage is more simple, more efficient and certainly more comfortable for the patient. It allows him freedom of movement in bed without the likelihood of disarranging apparatus or of breaking the syphon suction.

Our statistics show that with the use of the indwelling catheter the most frequent and annoying complication with which we have had to deal is epididymitis. The pathology of this condition will be readily remembered when one considers that nearly always the vesical neck and prostatic urethra are the seat of infection and that it requires but a slight exciting factor, such as the moderate traumatism of catheterization, squeezing scrotum and contents between the thighs, low hanging scrotum, etc., to cause the epididymis to flare up with an acute pyogenic infection, either through direct extension or lymphatic absorption. We, therefore, have applied to all cases a method of suspension of the scrotum by means of a T-binder and pads in the perineum to build up a nest in which the scrotum and contents lie suspended. Previous to this routine, we had epididymitis as a complication in 14 per cent. of cases of prostatism; since then epididymitis is rare.

When should the prostate be removed? This important question naturally comes to mind, and here, we think, is the kernel of the whole problem of prostatectomy. It is not so easily answered as asked. A number of conditions must be considered: the urine, the renal function, the blood nitrogen retention, and not least the general clinical and physical condition of the patient. Each taken separately cannot form a criterion upon which to base a judgment; all must be considered.

In our series, after instituting suprapubic drainage for a period of 10 days or 2 weeks, the specific gravity of the urine rose from a low point to a normal or nearly normal, the dry tongue became moist, the sallow skin cleared, the mentality became more acute, the appetite improved; in fact, there was marked advancement in the general condition of the patient.

There need never be any hurry to perform the second stage— the prostatectomy; indeed, the suprapubic drainage may be kept up for months if need be, or until such time as the patient is in condition for the prostatectomy. Herein lies the value, the safety of this method, for the general surgeon, for the general practitioner, for the man who has not at hand all the facilities of the large modern hospital, who has not at his call trained help, or who has not specialized training required for other methods of prostatectomy.

The Prostatectomy: The second stage the enucleation of the prostate, is performed under gas anaesthesia; rarely is ether anaesthesia used. However, ether anaesthesia is not contra-indicated provided it be light, just sufficient to cause relaxation, and the general condition of the patient warrants its use. With two fingers of one hand in the rectum, so as to bring the prostate upward into the bladder, it is enucleated by the gloved-finger of the other hand through the suprapubic sinus. The finger is pushed firmly and gently into the prostatic urethra which is thereby ruptured on the roof; then thorough enucleation is done along the natural line of cleavage, until the entire prostate, except the posterior lobe, which alone remains, is freed and pushed into the bladder through the opening in the prostatic capsule. There are some who militate against the use of the finger in the rectum; they claim that this forms a fixed point against which one works, and that thus there is danger of rupturing into the rectum; this danger, we think is slight, whereas the aid that comes from the finger in the rectum is real.

Thoroughness of enucleation is sought rather than any record for rapidity of enucleation. The hyperplastic prostate generally is quite large and easily enucleated, while the fibrous type takes more time and care, being small, hard and adherent. This latter, often requires the use of the prostatic rougeur and in this case the rectal finger again acts as a distinct aid and guard.

After enucleation the prostate is free in the bladder and is removed through the sinus by means of a sponge forceps. The prostatic cavity is thoroughly examined with the finger for completeness of enucleation. Nothing further is done to it .

A moderate amount of bleeding always follows prostatectomy; this comes from the prostatic plexus of veins. It is well to consider, at this juncture, the question of post-operative haemorrhage. This complication following prostatectomy, we consider is caused by two things, either by an inherent tendency in the patient to bleed or by the fact that the operator has gone outside the prostatic capsule and natural line of cleavage and has ruptured an artery. In our series, post-operative bleeding sufficient for packing or any other method of haemostasis has occurred but twice, and always in the one-stage cases. Bleeding in nearly all cases has been so slight that this has led us to adopt what we consider a considerable advance in the simplification of the management of these cases. We have abandoned catheters, tubes, packing and all method of drainage, except the suprapubic sinus itself following prostatectomy. Whatever clots form at the time of operation are removed with the sponge forceps. The wound is dressed; no tube is placed, no packing inserted. The wound is not sutured.

In the ward, whenever clots form, the nurse in charge of the case lifts away the dressings and gently picks them out. As long as clots form, they are removed, and care is taken that the bladder is never full of them, as this would cause the bladder to become distended, it would contract to empty itself and then cause more bleeding. If the bleeding is too severe and free, a Freyer tube is inserted and through this the clots are removed as they form.

Two factors we believe have influenced post-operative bleeding in our series of prostatectomy. One is the natural subsidence of the congestion and acute inflammation of the prostate and vesical neck consequent on the institution of suprapubic drainage, and the other is the haemostatic action of normal horse serum. We have in all of our cases administered subcutaneously 10 cubic centimeters of horse serum the afternoon previous to prostatectomy. This seems to have had a definite influence in lessening haemorrhage. In addition, before and after the operation, we administer by mouth, calcium lactate, 20 grains, every 2 hours; this latter acts as a haemostatic only during the period of actual administration.

Post-operative care after prostatectomy: On arrival in the ward a nurse is detailed to the patient. It is her duty to dress the wound whenever necessary and to remove with sterile sponge forceps the clots that form. The forceps is gently inserted into the sinus and the clots are picked out. Usually in 12 hours the bleeding has become so slight as merely to stain the dressings, and no further clots come away. The dressings are changed whenever necessary, at least every hour, and they are so arranged that only the dressings immediately in contact with the wound are changed, or only so many as need be. The bladder is left untouched for a period of 3 or 4 days, at the end of which time, the first bladder irrigation is performed by means of a catheter, through the suprapubic sinus—mild boric or mild silver nitrate solution being used. Following this there are daily bladder irrigations and after a period of 7 to 10 days the irrigation may be done by the catheter per urethram.

Care of the wound is an important business. There is nothing except prostatic obstruction, due to slough, granulation tissue, or the prostatic capsule forming an obstructing ledge, which will more readily delay healing, than a dirty wound. The wound is kept clean, first of all by keeping the urine acid, an alkaline urine will speedily form dirty, filthy incrustations and slough on a wound otherwise perfectly healthy. We administer sodium phosphate, and see that the patient drinks freely of water and other liquids. Should the wound become incrusted with salts or should the edges become sluggish, silvol crystals applied directly will clean the wound and give a healthy granulating base more quickly and with less discomfort than anything else. The surrounding skin is kept clean and free of uninary salt deposit by means of ointment-vaseline or boracic acid and by frequent dressing. Exuberant granulations are curetted or cut away. The surgeon must remember that the suprapubic wound to be permanently healed must heal from the bottom outward and his efforts should be so directed.

After the sinus has become smaller, healing may be hastened by the use of Biers cupping for 10 minutes twice daily. The suprapubic wound will heal if it is healthy, if it is kept clean, and if there is no obstruction at the vesical neck or in the prostatic urethra. It may be necessary at the end of 2 or 3 weeks to verify the patency of the urethra or vesical neck by the passage of the urethral catheter or urethral sounds, if the first two conditions obtain.

Should the suprapubic sinus persist it can be readily closed under local anaesthesia by purse-string suture about it after excision of all scar tissue; and then by folding over succeeding layers of healthy tissue to reinforce the primary line of suture. An indwelling catheter can be placed to insure proper healing. This is not always necessary.

In reviewing our statistics on prostatism a number of interesting facts come to light. During the past 5 years we have performed the following:

Type of operation	*No. of cases operated*	*Deaths*	*Mortality percentage*
Perineal..	5	0	0
One-stage suprapubic	57	2	3.5
Two-stage suprapubic	158	3	2
Suprapubic drainage *only*	6	3	50

Of the deaths in the one-stage cases, one occurred in an osteomyelitis of the tibia from embolus, 22 days after operation; the other from pneumonia, 14 days after operation. All deaths have been from causes outside the genito-urinary system; pneumonia in the more aged patients, acute cardiac dilatation and cerebral thrombi. No deaths were due to uraemia, formerly the cause of the extremely high mortality rate in the early days of prostatectomy.

The high mortality rate in these cases where suprapubic drainage alone was instituted was due to the fact that all these cases were admitted to the Department, *in extremis*.

Number of days in the hospital:

(1) Perineal prostatectomy
Average 81 days.
Shortest 65 days.
Longest 92 days.
All complicated cases with prognosis bad.
(2) One-stage suprapubic prostatectomy:
Average 45 days.
Longest 95 days.
Shortest 30 days.
(3) Two-stage suprapubic prostatectomy.
Average 50 days.
Shortest 24 days.
Longest 115 days.

Number of day's drainage between first and second stage in the two-stage cases:

Average 17 days.
Shortest 3 days.
Longest 65 days.

Average number of days of drainage before prostatectomy:

Perineal 10 days.
One-stage suprapubic 11 days.
Two-stage suprapubic 22 days.

Average number of days before patient is dry and remains so after prostatectomy: Perineal 50 days; One-stage suprapubic 26 days; Two-stage suprapubic 25 days.

Conclusions: For the general practitioner and general surgeon the two-stage suprapubic prostatectomy is the safest and simplest method of performing prostatectomy. Adequate, even prolonged catheter or suprapubic drainage before prostatectomy is essential. The clinical and physical condition of the patient and the laboratory findings together must form the basis for a judgment as to time for removal of the prostate. Post-operative haemorrhage following suprapubic prostatectomy by the two-stage method is rare. Tube drainage following prostatectomy is unnecessary. The simpler the technique and management of prostatectomy is made, the safer it becomes for patient and surgeon.

THE RESPIRATORY COMPLICATIONS AFTER 7,000 ADMINISTRATIONS GENERAL ANAESTHESTICS*

D. C. Aikenhead

Winnipeg, Manitoba

THE following study is a review of the anaesthetic case reports of practically all patients who have received a general anaesthetic at the Winnipeg General Hospital during a period of one year—7,000 cases in all.

Amongst this number there were some very poor operative risks, also some very short minor operations. Anaesthetics were administered, in the great majority of cases, by anaesthetists of some experience. Respiratory complications occurred in about the same ratio with each anaesthetist. Routine examinations were made of the circulatory, respiratory and renal systems. Any abnormality was noted upon the patient's chart, and a suitable anaesthetic was used for that particular patient. Great care was exercised in the examination of the patient the morning of operation for symptoms indicative of cold, coryza, or any mild febrile elevation of temperature of one or two degrees, having due regard to neurotic or hysterical manifestations.

The postponing of all cases with such symptoms for a few days, lessened respiratory complications materially.

All patients, except such as were emergency cases, had the following routine preoperative preparation; light supper, gentle purge, enema on the morning of operation, no breakfast, and an injection of morphine sulphate, gr. 1/6 with atropine sulphate gr. 1/150 one-half hour previous to the induction of anaesthesia.

The great majority of the patients had chloroform and ether, followed by pure ether throughout the operation. A number had ethyl chloride induction with an Ormsby inhaler; a small percentage had nitrous oxide with oxygen. A Gwathmey mask covered with several layers of stockinette was used in the majority of cases. A metal airway or oxygen was used when necessary to ensure sufficient oxygenization. As a rule there was very little difficulty with excessive secretion of mucus owing to the previous administration of atropine. Operating theatres were kept at 75° F. Patients were transferred to warm blankets on stretchers. Great care was exercised to avoid any chilling of the patient upon returning to the wards.

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*Read at a meeting of the Canadian Society of Anaesthetists, June 20th 1922.

There were nineteen cases of respiratory complications following the 7,000 administrations, with four deaths, giving a morbidity of 0.27%., and a mortality of 0.05%. Cold months show a higher pulmonary rate than warmer months. In January, February, March and December there were nine, while in the eight remaining months, they only totalled ten.

Respiratory complications occurred after the following operations: appendectomies, 8; tonsillectomies, 4; 1 each after the following; operation for harelip, for disease in prostate, in breast, in pelvis, in antrum, for the removal of the thyroid gland, and for extraction of teeth.

Of the nineteen cases, nine had definite lobar pneumonia, four broncho-pneumonia, one a pulmonary infarct, one an abortive type of pneumonia, four had a mixed respiratory infection. Two lung abscesses were due to tonsillectomies outside the hospital, and one case in which appendectomy was performed was probably a case of pneumonia, with appendical irritation. Of the four lung abscesses occurring after tonsillectomies, all had the clinical signs of lung abscess, confirmed by radiographs. All made good recoveries. No operative interference was necessary except in one patient, who had an artificial pneumothorax for two weeks. Of the eight cases of appendicitis who developed pulmonary trouble, six were emergent cases; all had acutely inflamed appendices, three with pus.

In brief, the history of the four fatal cases, was as follows:

(1) Male, aged sixty-eight; farmer; Canadian; previous operations, thyroidectomy, left herniotomy; has been obliged to change his occupation on account of cardiac trouble. Blood pressure, 185/85; arteries hard and tortuous; occasional râle in left apex; very bad pyorrhoea; operation; prostatectomy completed in one stage; nitrous oxide, oxygen plus one ounce of ether, duration forty minutes. There was considerable haemorrhage afterwards necessitating two injections of horse serum to arrest bleeding. By the third day, a definite right lobar pneumonia had developed; died on the ninth day.

(2) Female, aged forty-one; housewife; Canadian; patient in excellent condition; amputation of left breast with extensive removal of axillary glands. Chloroform one-half ounce; ether, twelve ounces; duration of operation two hours; condition of patient very poor on account of the amount of haemorrhage throughout the operation. Respiratory involvement was noted on the second day which developed into broncho-pneumonia, with pleural effusion and death in three weeks.

(3) Female, aged thirty-eight; housewife; Canadian; history of goitre for eighteen years; blood pressure 124/80; pulse, one hundred and thirty-two; thyroidectomy, seventy-two minutes ether plus oxygen. There was extensive haemorrhage at the end of the operation. The patient's condition was poor. The pulse and respirations increased in ratio; death occurred at the end of fifty-eight hours. This was classed as a broncho-pneumonic death, but the respiratory condition was a terminal one.

(4) Infant, male; aged eight months; Canadian; admitted with incomplete cleft palate and harelip. Temperature normal; cloudy discharge from both ears; operation notes, repair of left cleft palate and harelip; time seventy minutes; three ounces of a mixture of chloroform and ether used; pharynx well cleared of blood during the operation. Patient died sixty hours later of broncho-pneumonia.

From these case reports, the following seem timely suggestions:

1.—In septic cases the minimum amount of manipulation should be permitted during operation, to avoid breaking down the protective mechanism of nature against the infection, and setting free minute emboli into the blood stream. If possible, allow an acute case to subside and do an interval operation. It is surprising the number of acute cases that will subside if left entirely alone and with perfect rest.

2.—Efficient haemostasis throughout operation. Haemorrhage weakens the defensive powers of the body in direct ratio to loss of blood.

3.—Careful preoperative examination of patients, postponing all cases of coryza, and slight bronchial colds until respiratory tract becomes normal.

4.—Suiting the anaesthetic to the patient. For example, gas oxygen and local anaesthesia for tubercular cases.

There is no one measure that will prevent respiratory complications; where ward nurses, theatre staff, surgeon and anaesthetist study their patients, doing careful team work, pulmonary complications will be at a minimum.

FOCAL INFECTION IN THE TONSILS OF ADULTS SUFFERING FROM SUB-ACUTE AND CHRONIC SYSTEMIC DISEASE*

Analysis of Results of Removal in a Series of 800 Cases

R. S. Pentecost, B.A., M.B.,

Toronto

THE question of focal infections as a causative factor in many sub-acute and chronic systemic diseases is one which has been brought more prominently before the profession during the past decade.

Such conditions as myalgia, bronchitis, rheumatism, nephritis, cardiac and mental diseases, and even obscure cases of duodenal ulcer, colitis, etc. have been shown by Rosenow to be associated with some focal infection in the teeth, nose, throat, or other areas. That dread disease, sub-acute infective endocarditis, described so fully, by Cotton (*B. M. J.*, December 4th, 1920,) L. Murray, and others, has been shown to be chiefly due to the streptococcus hæmolyticus or the streptococcus viridans attacking not so much the healthy heart valves as those previously damaged by rheumatism or syphilis.

So many of these chronic conditions fail to respond to the usual medicinal forms of treatment that the tendency during the past few years appears to be for some enthusiasts to go to the extreme, and to remove the appendix, the tonsils, the teeth, and to open up all the accessory sinuses of the nose, in the hope of finding the focal infection and relieving the condition. Searching the literature on this subject one is impressed with the lack of accurate information on the results obtained from the removal of these foci of infection.

During the past three years, the writer has had the opportunity of investigating some six thousand of these sub-acute and chronic cases. Of these, 665 showed definite evidence of focal infection in the tonsils, and the results obtained by the removal of this infection are presented for your consideration to-day. In selecting the cases for analysis, we have confined ourselves to a certain series. The reasons for selecting this series are several. All the patients were adults in the prime of life between the ages of twenty and forty-five years. An accurate record was available showing their physical condition for a period varying from three to five years prior to operation. All were suffering from sub-acute or chronic disease for periods varying from one to five years, during which time they had been under medical care. Prior to the removal of the focal infection their general condition was very thoroughly investigated and full written reports submitted by physicians and surgeons who were specially qualified in their respective fields of work and who were assisted by complete laboratory and radiological examinations. The occurrence of error in diagnosis was accordingly largely eliminated. All the cases were referred by their respective physicians with the request that any foci of infection in the nose or throat be removed. After removal of the focal infection, they remained under the care for a considerable time, of the physician who was treating their systemic disease, and the latter furnished written reports on their progress from time to time. One was therefore able to form an accurate estimation of the effect, as far as a physical examination could reveal it, of the removal of focal infection.

In addition to this the writer prepared and sent to each patient a questionnaire. The latter contained the following questions:

(1) How long had your throat bothered you previous to removal of tonsils?

(2) How many attacks of tonsillitis had you had?

(3) Has your throat bothered you at all since removal of tonsils? If so, how?

(4) Were you suffering from any other trouble before operation, such as, chest, heart or kidney trouble, chronic bronchitis, asthma, anæmia, rheumatism, etc.? If so, please state same and duration.

(5) To what extent has this latter condition

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*Read before the Ontario Medical Association, Toronto, June 19[illegible].

improved since the removal of your tonsils?

A period of from six months to a year was allowed to elapse before this questionnaire was sent. It was considered that a shorter period was inadvisable owing to the fact that many chronic diseases respond favourably for a short time to almost any and every form of treatment. The answers received to the questionnaire were then considered along with the reports of their physical examinations, and the results as given to you to-day are based on these. A considerable percentage of patients (about twenty per cent), either could not be located owing to various changes of address, or failed to reply. In these cases we were dependent upon the report of their last examination by their own physician.

Bacteriology of nasopharynx and pharynx. Before discussing the operative measures employed, let me call attention to the bacteriology of the naso-pharyngeal and buccal mucous membranes. In an interesting and instructive report on the bacteriological examination of swabs taken from the tonsil crypts of some 937 cases of patients suffering from systemic disease, H. B. Anderson, Mann, and Sharp, *Medical Record*, Oct., 1921) state that the streptococcus viridans was found in 27.8%, the staphylococcus aureus in 12%, streptococcus hæmolyticus in from 9 to 25% of cases with occasional diptheroid bacilli, pneumococci, and a micrococcus catarrhalis. The research works of Lewis and Turner, Reynolds, Ritchie, Fraser, and others, show the same varieties of bacteria to be present often in the nasal and buccal cavities, and they also include the bacillus influenzæ, bacillus diptheriæ, and the bacillus coli communis. All of these organisms may be found at different times from swabs taken from the mouth or throat of perfectly healthy individuals with healthy mucous membranes. A. L. Bloomfield, (*Johns Hopkins Hospital Bulletin*, 32-33, Feb., 1921) states "non-hæmolytic streptococci and Gram negative cocci are constantly present and seem to constitute the true normal flora of the throat; in addition many other organisms may be recovered in cultures from normal throats, but their presence seems to be only transient."

Dr. G. W. Lougheed, at the request of the writer, made cultures from swabs taken from the tonsil crypts of twenty persons apparently in perfect health, giving a history of no attacks of inflammation in the throat, and found staphylococcus aureus in 80% of cases, non-hæmolytic streptococcus in 40% streptococcus hæmolyticus in 1%, viridans in 1%, micrococcus catarrhalis in 2%, pneumococcus in 3, bacillus coli communis in 0.5%. The logical conclusion to which one is forced, is that pathogenic organisms may be present in the crypts of healthy tonsils and be quite avirulent but capable of being stimulated by chills or traumatism to great virulence.

The Diagnosis of Focal Infection in the Tonsil. The diagnosis of focal infection in the tonsil should not be difficult one, but is one about which there appears to exist a great difference of opinion, if one can judge by the condition of the tonsils, the removal of which had been advised by enthusiasts. In determining the existence of focal infection in the series of cases presented herewith, the writer's examination included the following:—A careful inspection of the mucous membrane of the pharynx and pillars noting areas of local hyperemia, etc.; the application of firm pressure against the anterior pillar with a blunt instrument to cause the extrusion of the tonsil from its bed and the expulsion of any caseous material, debris, or pus from the crypts; noting the amount of fibrous tissue as evidenced by scar formation and adhesions to the pillars and the peritonsillar tissues; the palpation of the lymphatic glands at the angle of the jaw; taking swabs when thought desirable from the tonsil crypts for bacteriological examination; and ascertaining if there were any history of previous sore throat or tonsillitis.

In our opinion the most important factors to be considered as constituting a positive diagnosis, were the history of previous repeated inflammation of the throat, the presence of considerable fibrous tissue, adhesions, and caseous pus-like material; and the enlargement of the lymph glands at the angle of the jaw.

Methods of Removal of Infection. As to the methods to be used in the removal of focal infection of tonsils, there are three to be considered: (1) Use of the cautery and caustic drugs; (2) Application of high frequency electric current (fulguration) and x-rays; (3) Surgical operation. Regarding the cautery. Anderson states (*Medical Record*, Oct., 1920) "The use of the cautery and caustic drugs, by increasing the amounts of scar tissue and thus interfering with drainage, appears difficult to justify on pathological grounds." In our experience, the application of the cautery fails in many cases to get rid of the deep seated infection in a small fibrous tonsil, and this method of producing large sloughs, with the consequent danger of hæmorrhage and infection, does not commend itself to us as a sound measure. With the high frequency current and x-rays we have had little experience. J. B. Murphy, Craig, and R. G. Hussey (*J. A. M. A.*, 76-228, Jan. 1921.) speak enthusiastically of the x-ray method of reducing the size of the tonsil, but according to their reports, cultures show that the rays did not directly affect the organisms. They consider the infection was removed by the provision of free drainage from the tonsillar crypts. T. M. Stewart (*Laryngoscope*, Page 706, 1920) also advocates fulguration for removing infection. W. D. Witherbee (*A. J. Roentgenology*, Jan. 1920) also reports good results from x-ray and speaks of it as a diagnostic measure in determining relationship between the focus and a given systemic infection. In reference to treatment, he states that, "in diseased tonsils associated with any co-existing condition, contra indicating operation or anaesthesia, it may be used,"

The present status of these methods has not yet been fully determined, and these methods are further open to the objection, (as admitted by those chiefly using them) that, while they will undoubtedly reduce the size of the tonsil by scar formation, the rays themselves do not destroy the infection. We must await further investigation before adopting x-rays in preference to surgical operation.

Technique of Operation. It is not our intention here to discuss the various operative procedures for the removal of the tonsil. As our aim was to remove the focal infection, and, as we were dealing in practically all cases with small atrophic fibrous tonsils bound down by adhesions, we chose only one method—the removal in toto of the tonsil and its capsule. In the writer's experience this can be most satisfactorily performed by the use of the Leland knife to free the pillars, the blunt dissector or curved scissors to free the upper pole of the tonsil, and the wire snare to complete the removal.

Anaesthesia. General anaesthesia, Ethyl chloride and ether, with the patient reclining, was used in about 60% of cases. Local anaesthesia—2% novocaine to which is added one minim to the dram of 1-1000th adrenalin solution, with the patient sitting, was used in approximately 40% of cases. If a general anaesthetic was used, the patient's head was extended and suction apparatus employed to prevent the inhalation of infective material. Particular attention was paid to the removal of all tonsillar tissue including the lingual tonsil, and to the complete stopping of haemorrhage before the patient left the operating room. The operations were performed by the writer and by his associates, Drs. A. A. Halliday and D. M. Campbell.

Post-Operative Care. All patients were kept in bed for two days following operation, and confined either to hospital or to their home for a period of one week. Their throats were examined the day following operation and for several times previous to discharge from the hospital.

Complications. Due to anaesthesia. We found that cases of neurasthenia, cardio-vascular disease, mental and organic nervous diseases, disordered action of the heart, and goitre, were poor subjects for *local* anaesthesia, and generally showed more or less evidence of shock. Other cases showed practically no reaction or toxic symptoms.

There was one death due to a local anaesthetic; this man suffered from defective action of the heart and neurasthenia. Following our custom with patients to be operated upon under local anaesthetic, he received, twenty minutes before the operation, a quarter of a grain of morphia and 1-150th grain of atropin. He had received about ten minims of solution injected into the anterior pillar on the right side when he suddenly collapsed in the chair, became very cyanosed, lost consciousness and showed slow laboured respiration. Breathing ceased after three minutes. At the end of fifteen minutes no heart sounds could be heard: artificial respiration was instituted and continued for about one hour and oxygen was administered but with no success. Although the actual injection in this case was performed by one of my associates, I was present at the time, and a few minutes previously had injected three other patients with the same solution used in this case; they showed no toxic symptoms. One can therefore conclude that this patient had a particular idiosyncrasy for the drug.

Haemorrhage. During the operation it was our custom to control haemorrhage by the use of a gauze sponge held in the tonsillar fossa. If this did not stop the bleeding, artery forceps were placed on all spurting vessels and allowed to remain on for from two to three minutes.

In the majority of the patients this procedure was found to be sufficient to stop the haemorrhage completely. In four cases it was deemed advisable to ligate vessels. In approximately 30 cases there occurred some post-operative haemorrhage from the tonsillar fossae; 16 of these had been operated on under a general anaesthetic and 14 under local anaesthetic. 22 occurred within twenty-four hours following operation, and 8 in from three to six days. In no case were the haemorrhages serious enough to require any special measures by the operator. All were easily controlled by removing the blood clot which had formed in the fossa, gently swabbing out the latter with hydrogen peroxide, and using gentle pressure with a gauze sponge placed within it. In no case of post-operative haemorrhage was it found necessary to apply artery forceps or to use other complicated methods of stopping the bleeding. In the cases occurring after the lapse of twenty-four hours, it was noted that some elevation of temperature, varying from 99 to 101, was present for a few days.

In 15 cases is was considered advisable to estimate the blood coagulation period. This varied from three to ten minutes, but did not appear to have any relation to the amount of bleeding that occurred during operation. In one case of pernicious anaemia whose coagulation period was over 8 minutes, it was noted that the amount of blood lost at operation was less than one dram. Calcium lactate, ten grains three times a day was used with a few patents for several days previous to and following operation as a precautionary measure, but there is no direct evidence that the amount of bleeding was affected in any way.

Infection. As stated above, the cases which had a post-operative haemorrhage occurring at a later period than 24 hours following operation showed some elevation of temperature. This was associated with a slight headache and general malaise, and continued from four to six days. One case on the tenth day following operation developed an acute infection of the peritonsillar tissues on the right side resembling a typical quinsy. Considerable pus was evacuated from this area and recovery was uneventful. It was interesting to note that careful inspection showed the complete absence of any tonsillar tissue in either fossae. Our records show no case of post-operative pneumonia, lung abscess, or of otitis media following operation.

Deaths. One death followed operation. This patient had valvular disease of the heart and evidence of sub-acute endocarditis. His tonsils were removed under a general anaesthetic. On the second day after operation he complained of aching pains in various parts of his body especially over the praecordium and the back, his temperature rose to 102, and his pulse to 140. There was no evidence of local infection of his throat. He developed a general streptococcic septicaemia and died ten days later. His throat was practically healed at the time of his death. His death was attributed to an acute exacerbation of his chronic endocarditis induced by the operation on the focus of the infection in his tonsils.

Results. It is noted in an analysis of a number of cases reported by Drs. Coakley and Pratt (*Laryngoscope,* Feb., 1922.) that the method of basing results upon the answers of patients to a questionnaire somewhat similar to our own was used. We have endeavored to improve on this method by correlating the replies received with the reports of physical examination. It should also be mentioned that many cases showed by radiogram some focal infection of the teeth; the latter was treated by our dental confreres. One should also state that some cases showed slight focal infection in the nasal passages which was treated at the same time.

Local Results. Twenty three patients, in answer to Question 3, stated they had had some trouble with their throat since operation. Two stated they had had acute tonsillitis. Our records of one show that on examination, before discharge from hospital, it had been noted that a small portion of the base of his left tonsil remained; patient did not wish to have this removed. It was subsequently removed but, in answer to our questionnaire sent the patient several months later, he stated he still had very severe attacks of sore throat. The other patients stated that they had had slight sore throat at intervals since the removal of their tonsils. In no one of these cases was any tonsillar tissue found remaining in the fossa. In 8 cases there was a definite hypertrophy of the lymphoid tissue on the posterior or lateral wall of the pharynx.

Classification. In explanation of the table appearing on next page:—Bronchitis includes cases showing definite signs: e.g. adventitious sounds, etc. of chronic bronchitis; also cases subject to recurrent attacks of acute bronchitis, and showing by radiological examination, definite peribronchial thickening. These cases, as well as those of tuberculosis are from the service of Drs. A. W. H. Caulfeild, Anglin, Macintyre, and Ogden.

Cases of disordered action of heart include: those showing irregularity in rate and rhythm of the heart beat, associated with dyspnoea, fatigue, and other signs and symptoms, but no definite organic change in the heart itself. Some showed slight enlargement of the thyroid gland and evidence of mild hyperthyroidism. They were referred from the service of Dr. Leonard Murray. The results obtained in this type of case are the most favourable of all those operated upon.

The cases of organic nervous diseases, neurasthenia and neurosis, were referred from the service of Drs. Boyer, A. Fletcher, and Lewis. Under neurosis are included those cases, who, in answer to the questionnaire, stated they suffered from various disabilities, but, whose physical examination showed no signs of any definite disease.

Cases of osteo-arthritis as well as others of a surgical nature, were referred from services of Drs. C. L. Starr, N. Shenstone, and E. S. Ryerson.

Under the heading of general debility are included cases which showed no definite signs of any particular disease but who complained of various symptoms, such as, fatigue on slight exertion, occasional headache, loss of appetite, insomnia, constipation, etc. These cases, as well as those of rheumatism, myalgia, and other medical conditions were referred from the services of Drs. H. Parson, Cooper-Cole, and N. Maclaurin.

Tabulation of Results

Disease		Cured		Marked Improvement		Improved		Unimproved.	
	Total	No.	%	No.	%	No.	%	No.	%
Rheumatism Myalgia Neuritis	104	24	23.1	45	43.3	21	20.2	14	13.4
Bronchitis	142	13	9.2	39	27.5	26	18.2	64	45.1
Tuberculosis:									
(a) Active	9	—	—	1	11.1	2	22.2	6	66.7
(b) Arrested	8	—	—	3	37.5	3	37.5	2	25.
(c) Suspect	6	—	—	2	33.3	1	16.7	3	50.
Valvular heart disease	24	—	—	5	20.8	5	20.8	14	58.4
Disturbed action of heart	58	19	32.8	26	44.8	7	12.1	6	10.3
Pernicious anæmia	4	—	—	1	25.	1	25.	2	50.
Goitre	6	—	—	2	33.3	2	33.3	2	33.4
Nephritis	14	2	14.2	4	28.6	4	28.6	4	28.6
Asthma	30	2	6.7	6	20.	6	20.	16	53.3
Pleurisy	6	1	16.7	3	50.	1	16.7	1	16.6
Furunculosis	2	1	50.	1	50.	—	—	—	—
Chr. laryngitis and tracheitis	6	2	33.3	2	33.3	1	16.7	1	16 7
Migraine	10	4	40.	4	40.	1	10.	1	10
Cervical adenitis	4	2	50.	2	50.	—	—	—	—
Neurasthenia	53	10	18.9	26	49.1	10	18.9	7	13.1
Chr. tonsillitis	141	118	83.7	23	16.3	—	—	—	—
General debility	56	17	30 4	26	46.4	9	16.1	4	7 1
Recurrent coryza	30	18	60.	8	26.7	2	6.6	2	6.7
Painful scars (GSW)	12	3	25.	4	33.4	1	8.3	4	33 3
Cholecystitis	2	—	—	—	—	1	50.	1	50.
Osteomyelitis	6	2	33.3	2	33.3	2	33.4	—	—
Synovitis	6	—	—	1	16.7	1	16.7	4	66.6
Chr. gastritis and duodenal ulcer	2	—	—	—	—	1	50.	1	50.
Deafness	40	6	15.	12	30.	12	30.	10	25.
Skin affections	2	—	—	1	50.	1	50.	—	—
Angio-neurotic edema	1	—	—	—	—	—	—	1	100.
Neurosis	29	—	—	—	—	—	—	29	100.
Organic nervous disease	3	—	—	—	—	—	—	3	100.
Epilepsy	3	—	—	—	—	—	—	3	100.
Mental disease	2	—	—	—	—	—	—	2	100
Prostatitis	2	—	—	—	—	—	—	2	100
Osteo-arthritis	14	—	—	—	—	—	—	14	100
Sub-acute bacterial endocarditis	3	—	—	—	—	—	—	3	100
Progressive muscular atrophy	1	—	—	—	—	—	—	1	100

Deafness. These are cases in which the deafness was due to chronic catarrhal and adhesive otitis media.

CONCLUSIONS.

(1) Haemorrhage either during or after operation is easily controlled and should not be considered as a contra-indication to the removal of infected tonsils by a competent operator assisted by a skilled anaesthetist.

(2) Post-operative complications very seldom occur if the technique and post-operative care as used in these cases are employed.

(3) Focal infection in the tonsils is a definite causative factor in disease and its removal is indicated in the following diseases:—Rheumatism, myalgia, neuritis, cervical adenitis, chronic catarrhal and adhesive deafness, disordered action of the heart, general debility, neurasthenia, migraine, and recurrent coryza.

(4) Focal infection, by lowering the natural resistance of the body may be contributory though not a definite causative factor, in the production of the following diseases:—Chronic bronchitis, valvular disease of the heart, neurosis, mental diseases, asthma, nephritis, osteomyelitis, synovitis, gastro-intestinal disease, pleurisy, furunculosis, cholecystitis, skin affections, painful scars, tracheitis, goitre, pernicious anaemia, and tuberculosis. The oto-laryngologist may afford assistance in these cases in determining when a focal infection is present but the removal of the tonsil should be advised only after careful consideration and consultation with the physician treating the systemic disease.

(5) In our group of cases the following diseases when chronic were un-influenced by the removal of focal infection:—osteo-arthritis, epilepsy, sub-acute bacterial endocarditis, prostatis, anglo-neurotic œdema, progressive muscular atrophy, and organic nervous diseases.

As so well stated by Eddington, we know very little as to the incidence, varying virulence and selective distribution of pathogenic and pyogenic bacteria, and there is a great field of research open for the collaboration of the bacteriologist, pathologist, and surgeon, and with this collaboration it is hoped that treatment may become less empirical and general, and more scientific and accurate.

OBSERVATIONS ON SOME THROAT CONDITIONS IN CHILDREN

EDMUND BOYD, B.A., M.B., M.R.C.S. (Eng.)

Surgeon-in-Chief, Department of Oto-Laryngology, Hospital for Sick Children, Toronto

THE following remarks are incited by the results of observations carried on from time to time. They do not pretend in any sense to be final, and are offered more in a spirit of suggesting matter for further investigation, and points on which discussion would be welcomed.

(1) In the description of tonsils, the terms, pendulous, and buried are commonly used, yet no explanation for the occurrence of these conditions is recalled. It would appear that the shape and position eventually assumed by the tonsil is governed to a great extent by the state of development of the palato-glossus muscle, and by its strength in contraction. The palato-pharyngeus is almost always a strong muscle, while the palato-glossus varies in size greatly. In some it is a fairly strong muscular band, in others it is very slight or almost absent. In the act of swallowing, gagging, or vomiting, strong contraction of these muscles takes place; the effect being to approximate each to the other, and to squeeze what is between. One can imagine a sphere under frequently repeated pressure by two opposed contractile bands becoming gradually eccentric, every muscle contraction tending to press it further into that condition. This seems to take place in the case of the tonsil, and it is in the individuals with a relatively strong palato-glossus muscle, that we find well marked pendulous, or well marked buried tonsils. A few cases have been observed in which the tonsil has not moved, but has been pressed into a more or less dumb-bell shape. By virtue of this pressure, the buried tonsil tends more and more

to have the drainage of its crypts shut off, while it develops a larger size from inflammatory reaction. There is a practical application of these facts to be noted by the surgeon in the operation for removal of the tonsils. The pendulous type are more easily approached with the patient lightly under the anæsthetic and gagging; the muscles will then help in the operation; in the buried type, the muscles are antagonistic, and complete relaxation is desirable.

(2) The popular explanation that snoring is caused by vibrations of the soft palate is quite fanciful. The mechanism can easily be observed during the course of an anæsthetic. Snoring takes place during inspiration, only when the individual is in such a position, with the muscles of the tongue sufficiently relaxed, as to allow its base and the epiglottis to fall backward, thus shutting off free air entry into the larynx. There is an appreciable pause after the commencement of inspiration, during which time the epiglottis and the base of the tongue are pulled downward over the larynx; soon, the negative pressure in the thorax becomes great enough to draw the air through the narrowed opening, which acting like a reed in an organ pipe, sets a column of air into vibration.

(3) Much has been said of the deformity or lack of development of certain bones of the head, as a result of defective nasal breathing in early life, and expecially of the type associated with adenoids. Much more investigation is needed on this problem before any definite statements can be made. The deficient aeration theory does not explain the narrowing of the lower jaw occurring independently of that of the upper; nor the narrowing and the high arched palatal processes in many cases of cleft palate. From a personal experience only two cases are recalled of the type commonly figured as the extreme type of adenoid facies. In these, children, both of about fourteen years of age, other than the narrowing, there was little abnormal about the interior of the nose and the post nasal space. There was no obstruction. Evidently these were deformities due to some developmental fault. Three cases presented themselves some years after badly performed operations in early childhood, in whom the palate had become adherent to the post-pharyngeal wall, thereby shutting off the normal airway. In no one of these was there any arrest of development of the interior of the nose, nor any abnormality of the palate and teeth. Moreover, one must always consider the great number of cases operated upon for adenoids and tonsils in whom no resulting deformity exists. The nasal obstruction resulting from adenoids is in most cases not a mechanical obstruction by the mass, but is due to the secondary rhinitis, with the swelling, and partial organization of the susceptible tissue, mainly that of the inferior turbinal. Proper removal of the adenoids and correction of the nasal obstruction does not alter the shape of the palate, jaw, or teeth, if such deformity is already present. Some striking results have been arrived at by skilled orthodontists, but the removal of the adenoids is a very necessary preliminary from the standpoint of general health. It would appear that the departure from the normal, in the defective growth of the bones under discussion, is more of a biological problem, in which conditions of general health and nutrition in early life, and the proper development of both primary and secondary teeth are apparently of great importance.

(4) The last subject I should like to refer to is that of the affections of the tonsils in infancy. Acute inflammations may occur almost at any age; they may be of all grades of severity, even to the virulent streptococcic infection with brawny infiltration of the tissues of the pharynx, upper part of the larynx and neck. Well marked chronic conditions have been occasionally observed in infants of only seven months. One may find chronic follicular types, some of them with a purulent exudation, and others with an accumulation of debris in the crypts. Occasionally one meets as early as the first year of life the type of chronic inflammation in which there is a greenish caseous degeneration of accumulated debris, with excavation of the tonsillar substance—evidence that the condition had existed for a long period. The pediatricians have traced many general conditions directly and indirectly to infection in the tonsils, and it seems logical to infer that the arguments in favor of operation in older individuals, would apply also in the case of infants, no matter how early the age. Infants bear the operation of removal remarkably well; the younger the infant the less the reaction. Many recover with apparently no disturbance, but it is a delicate operation, and may at times be an awkward one. The diagnosis and care of affections of the tonsils is in my opinion of general medical concern, and for a proper diagnosis there is need not only of the knowledge gained from the local examination, but also of all the information that may be derived from a careful general medical examination. The physician in charge should be always consulted, and should have a voice in the treatment decided upon.

THE ADVANTAGES OF GAS INFLATION IN OBSTETRIC AND GYNÆCOLOGIC DIAGNOSIS WITH ESPECIAL REFERENCE TO ITS IMPORTANCE IN THE STUDY OF THE CAUSES OF STERILITY*

Reuben Peterson, M.D.

(From the Department of Obstetrics and Gynæcology, University of Michigan)

Ann Arbor, Michigan

DURING the past two years gas inflation of the pelvis has been used for diagnosis in over four hundred cases in the obstetrical and gynæcological clinic of the University of Michigan Hospital. In most of these cases roentgenography was combined with gas inflation, enabling the pelvic roentgenograms to be studied and serve as a record of the pathological conditions present. In previous communications I have dwelt purposely upon roentgenographic technique and results since it was felt that perhaps this was the most important feature of this new diagnostic procedure. However, to secure good films of the pelvic structures and to interpret these films, the clinician must co-operate with the roentgenologist. In our own clinic gas inflation with or without roentgenography has become as well established as has bimanual examination. The pelvic roentgenogram has become as indispensable, in doubtful cases, as is the gastro-intestinal roentgenographic examination in establishing preoperative diagnosis.

In this paper, however, I propose to approach gas inflation from a new angle and dwell upon its advantages in determining the causes of sterility. I do this the more readily since the method is simple and without danger, if certain commonsense precautions be borne in mind. In ordinary cases no roentgenographic apparatus is necessary, rendering it possible for the intelligent practitioner to utilize this exceedingly valuable addition to our diagnostic armamentaria.

Gynæcologists have long felt that the entire question of sterility in the human female has not been dealt with as scientifically as have other parts of their specialty. In addition to anatomical causes of sterility both in the female and the male there are certain other causes which have long defied explanation.

In order that conception may occur, the fallopian tube must be permeable enough to allow of the passage upward of a spermatozoon. At the same time the tube must be sufficiently patent to permit of the passage toward the uterus of the ovum, leaving out of consideration the rare cases of ovarian pregnancy where the ovum is fertilized and develops in a Graafian follicle. Obviously it is therefore necessary to determine the patency or non-patency of the tubes in any given case of sterility, since if both oviducts be closed, no matter how normal may be the other factors in the case, pregnancy can not occur.

Much as it may disagree with the ideas of certain examiners, it can be stated positively that it is absolutely impossible to render an opinion regarding the patency or non-patency of the fallopian tube by bimanual examination of the contents of the pelvis. To say from such an examination that the tubes are not enlarged or adherent and therefore normal is entirely unwarrantable. As will be demonstrated later from actual clinical cases bimanual examination may reveal no lesion of the tube or other pelvic organ, yet the tubes may be closed at their fimbriated extremities.

Again, with open fimbriated extremities any portion of the tubes may be closed from the open ostia to where they empty into the uterus, without enlargement or adhesions detectable to the examining finger. In order to prove the truth of the above statements, my assistant, Dr. R. S. Cron, has analyzed from the clinic seventy-five cases of sterility in which gas inflation, sometimes with and at times without roentgenography, has been used to determine the patency or non-patency of the tubes. The findings in these seventy-five cases of sterility will be reported in detail by Dr. Cron at the St. Louis meeting of the American Medical Association. However, I shall take the liberty of quoting freely from the statistics in his paper.

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*Read before the Ontario Medical Association, Toronto, May, 1922.

The seventy-five cases of sterility were divided into two groups, one where the tubes under gas inflation were found to be patent and another where repeated attempts at gas inflation under high pressure showed the tubes to be closed. There were forty-one cases with closed tubes in thirty-one of which some pathologic condition of the pelvic organs was demonstrated by bimanual examination. In ten of the forty-one cases with closed tubes the most careful bimanual examination failed to reveal the slightest abnormality. Where the tubes were closed and the gas was introduced through the abdominal wall, roentgenography showed pelvic lesions in all except five cases, demonstrating that the roentgenogram was twice as accurate, in this series at least, as the examining finger.

As I have stated in previous articles on this subject I am fully aware of the criticism which will be aroused by the above statement that more accurate pelvic diagnosis can be made by gas inflation and roentgenography than by bimanual examination. It is contrary to the preconceived ideas of examiners who have had experience with thousands of cases. Yet it is absolutely true even in the case of the most expert examiners as I have proved in my clinic many times.

The mere palpation of enlarged appendages with or without adhesions with history of previous inflammatory disease, does not signify that the tubes are closed. This can only be determined by gas inflation with the proper technique. Looked at in another way the patient whose tubes are closed as demonstrated by gas inflation can not conceive. The patient with appendages adherent and enlarged from inflammatory disease but with one or both tubes permeable to gas under pressure may be sterile but conception is possible. Such conception may result in abnormal nidation, as illustrated by ectopic pregnancy or it may be normal. The main point is that conception in such cases is possible in contradistinction to the other class of cases where the tubes are closed and conception is absolutely impossible.

It has been all too frequently the custom when bimanual pelvic examination failed to reveal any abnormality and the husband was proved to be normal, to state to the patient that while the pelvic examination was negative the only way to determine absolutely as to the patency of the tubes was by direct inspection and exploration after laparotomy. This is an illogical statement because the tubes may be open and permeable to a small probe up to the isthmic portion, yet may be closed at some point beyond this area. Again, it is by no means certain that even the finest probe can be passed through the isthmic portion of the normal tube into the uterine cavity with any degree of certainty. Surely the use of the ordinary surgical probe passed through the ostium gives no reliable information as to the patency of the tube. Therefore, in the presence of a method for determining the patency or non-patency of the tubes which is safe and certain, indefinite and unwarrantable statements such as the one referred to above must give way. The mere fact that the tubes are found patent by gas inflation does not mean that conception will occur as shown by the fact that out of the seventy-five cases of sterility in thirty-four or nearly one-half one or both tubes were open. The problem of sterility, however, must be first investigated along this fundamental line as to whether or not the tubes be patent. If gas inflation shows them to be closed, the problem becomes surgical because only through surgery except in rare cases to be referred to later can the oviducts be placed in such a condition as to permit of the union of the ovum and the spermatozoon. This does not mean that operation should be advised for the cure of sterility as soon as the tubes have been proved impermeable. Plastic operations upon the tubes under present technique are not devoid of danger and are far from certain as regards the maintenance of patency. Certainly it is the height of folly to advise operation for closed tubes until the male has been carefully examined. I recall distinctly a case where both wife and husband, especially the latter, were desirous of offspring after a sterile five years' marriage. By gas inflation the tubes were found completely closed. Then came the query from the patient if the condition could not be remedied by operation. It was explained that before such an operation be undertaken the husband's fertility had to be established. The latter scorned the idea that there was anything the matter with him and readily agreed to arrangements whereby his semen could be examined post coitus. Great was his surprise and chagrin to learn that careful microscopic examination failed to show a single spermatozoon. He had denied venereal disease but now readily admitted having had a double orchitis. A salpingostomy on the patient obviously would have been futile.

The conscientious practitioner's first thought will be the possible danger to his patient if gas be forced under pressure through the uterus and up through the tubes into the pelvic cavity. On first consideration it would seem as if pelvic irritation and even peritonitis might result from forcing septic material from the tube into the peritoneal cavity. Experience in hundreds of cases as reported by Rubin, ourselves and others shows that in properly selected cases there is no such result. It can very well be imagined that peritonitis would be set up by gas inflation in acute inflammatory disease of the uterus and tubes. However, it is one of the cardinal rules of gynæcology that instrumentation is contraindicated under such conditions and the same rule applies to gas inflation. The latter is contraindicated in the presence of profuse purulent or hæmorrhagic uterine discharge or in the presence of fever due to pelvic inflammatory disease.

In advocating transuterine gas inflation by the general practitioner I limit the recommendation to only those with intelligence and experience enough to understand thoroughly the indications for its use and to become familiar with the contraindications. No new method of diagnosis or treatment was ever brought forward that was not followed by warnings from specialists of the dangers of the methods in the hands of men doing general work. Gas inflation under some conditions can be dangerous; so can the removal of a pus tube. It is the duty of the man among the first to use a new method to point out its advantages, to describe accurately its technique and to set forth clearly contraindications to its employment. Gas inflation either by the transuterine or transabdominal route in properly selected cases as demonstrated by many hundreds of cases is a perfectly safe procedure. In over four hundred cases in our clinic there has been no sign of resulting peritoneal irritation. In two cases there were quite alarming symptoms following the inflation but in each case it was our own and not the fault of the method. From the very first we have warned against gas inflation in cases of circulatory disturbance or in cases in which the latter might result from rearrangement of the intra-abdominal pressure. Yet in each of the cases referred to we failed to heed our own warning. One was a case of quite advanced cirrhosis of the liver, the other a rather large abdominal tumour encroaching upon the upper abdominal space. The transabdominal method was employed in both instances and rather alarming circulatory disturbances followed the introduction of about seven hundred cubic centimeters of carbon dioxide gas. The symptoms rapidly subsided as the gas was absorbed. So far as our clinic is concerned, the lesson has been learned. Anyone using gas inflation is in duty bound to learn of these and of possibly other conditions and avoid such errors in his own work.

These cases not only showed the danger of circulatory changes following gas inflation but they also showed the advantages of carbon dioxide over oxygen for gas inflation. The former is quickly absorbed while oxygen may not be absorbed for days. So readily is carbon dioxide gas absorbed that out-patients or office patients may be inflated for diagnostic purposes and within one-half hour leave the examining room perfectly free from pain and discomfort. This is not the case with oxygen where pain following the injection may remain for many hours. So rapidly is the carbon dioxide gas absorbed that the patient can not be transported after inflation to any great distance for fluoroscopic or roentgenographic purposes, necessitating the use of a portable apparatus or the inflation being done in a regular roentgenographic room, which is sometimes difficult to arrange for.

The fluoroscope is unnecessary to determine by gas inflation the patency or non-patency of the fallopian tubes, hence a very simple office equipment is all that is required. This consists of a tank of carbon dioxide gas obtainable at any soft drink supply house. To control the outflow of gas which is under high pressure in the tank, a reducing pressure valve is necessary. If to this be added a needle valve, so that the pressure can be accurately and easily regulated the work of the operator is rendered easy. To answer the invariable question I may say that such a pressure reducing apparatus may be obtained among other places from Bishop Babcock Company, of Cleveland. The new type of apparatus designed by Rubin and manufactured by Machlett and Son, of New York, consisting of a one piece syphon meter and a mercury manometer is a great improvement over the old apparatus. By means of the pressure reducing valve the pressure of the outflowing gas can be set to about twenty-five pounds and the tank connected with the syphon meter by a rubber tube. By means of the needle valve the flow of gas through the syphon meter can be regulated to about four pulsations to the minute or an unobstructed outflow of gas of about 100 cc. Better still is it to follow Rubin's latest suggestion that with the outflow obstructed the pressure be regulated by the needle valve so that it will require fifteen seconds to raise the mercury column 100 mm. It is highly essential to grasp these few simple rules before trying to force gas through the tubes. Not only is it necessary to regulate the gas pressure to the point suggested by experience but if the gas be allowed to flow too rapidly the resulting high manometer readings may be misinterpreted. The tubes will be considered impermeable when in reality gas is entering the pelvic cavity through the fimbriated extremities but not so rapidly as to take care of the large amount of gas being forced into the uterus under too high a pressure. It is for this reason that the flow is regulated to four pulsations or fifteen seconds to raise the mercury column 100 mm. The above applies to tubes with fairly open lumina. When the tubes are not closed but partially obstructed from inflammatory changes it may be necessary to reduce the pulsations of the syphon meter to two or three per minute else high manometer readings may be misinterpreted.

It has also been found by experience that the gas passes through unobstructed tubes at about 80 mm. of pressure rather rapidly falling 20–40 mm. as the gas continues to flow. If the manometer reading rises steadily to 200 mm. without dropping it shows the gas is not passing through the tubes, provided the above rules have been complied with. The flow of gas is then stopped, the mercury column allowed to fall and another attempt is made to pass the gas. The pressure should never be carried above 200 mm. but the tubes are not considered impermeable until ten or twelve consecutive attempts have been made, each time the flow of gas being interrupted when the pressure reaches 200 mm. This rule has followed the final passage of the gas after repeated attempts, the gas finally overcoming partial obstruction of the tubes.

As has been stated the fluoroscope is unnecessary to the establishment of the patency or nonpatency of the tubes. If the rubber obturator of the uterine cannula through which the gas passes into the uterus fits the cervix tightly and the manometer reading is below 200 mm., gas must be passing into the pelvic cavity if there be no bubbling of the gas about the rubber obturator. Confirmatory evidence of the passage of the gas or patency of the tube or tubes is a sensation of pressure just above the pubes after about two or three hundred cubic centimeters of gas have entered the pelvis. If any further proof be needed it can be furnished by having the patient assume the sitting posture whereupon pain develops in the right shoulder due to an accumulation of gas under the diaphragm and a dislocation downward of the liver.

In our own clinic the Sim's is preferred to the dorsal position as giving a better exposure of the cervix and an easier passage of the cannula. It is essential to remember that all instruments must be scrupulously sterilized and that manipulations be of the gentlest. Recently, to avoid cervical contraction after iodine application, picric acid has been substituted. The greatest discomfort arises from the seizure of the anterior cervical lip with a double tenaculum forceps in order that it may be steadied for the passage of the uterine sound and cannula and held firmly so that the obturator will fit snugly.

If bimanual examination prior to the transuterine passage of the gas has demonstrated palpable pelvic lesions it is customary, in the clinic, where the tubes are patent to allow the gas to flow until 1,000 cc. have passed, whereupon roentgen films are taken for a careful stereoscopic study of the pelvic pathology. In case of closed tubes the same thing is accomplished by the transabdominal route.

Personally I feel as if the use of gas inflation as a diagnostic procedure has only begun. I am not at all convinced that its use can not be extended as a therapeutic agent. Certainly I know of a number of instances where pregnancy has followed the dilatation of obstructed tubes by gas. It may also be possible to use it after salpingostomy for closed tubes to keep open the lumina of the tubes. Gas inflation opens up a new field in gynaecology and is an answer to those who claim that this specialty has been exhausted; that after all it is merely a surgical field and for that reason should be a part of general surgery.

Case Reports

A CASE OF CHRONIC RHINITIS, TREATED BY RADIUM

W. H. B. Aikins, M.D.

Toronto

This case of a man of thirty-four, was referred to me by Dr. H. D. Courtenay, of Ottawa, who furnished the following previous history:

On December 6th, 1919, the patient had his tonsils enucleated under general anaesthesia, after which the throat healed well. On December 24th, 1919, a submucous resection of the nasal septum was made. Some infection of the nares developed, and synechia formed. The synechia were divided, but the infection only subsided and did not clear up entirely. The discharge persisted but was not purulent. On January 28th, 1920, the nose became inflamed due to infection of the follicles of vibrissae. This continued and spread to the upper lip, which had to be shaved. The condition resisted treatment by vaccines, ointment, antiseptic lotions; even autogenous vaccine failed to clear it up. Any attempt to let the hair grow was followed by a recurrence of the condition as bad as the first attack. Granulation tissue developed in the area of vibrissae and was cauterized with partial success.

In July, 1921, radium treatment was undertaken. A diagnosis was made of mixed infection, probably due to a staphylococcus. Radiation was begun July 29th. At this time 10-milligram tubes were used in two positions in the nostrils, each tube remaining in situ for six hours. Flat radium plaques, heavily screened, were applied over the area of ulceration on the upper lip, giving a dose of 54 milligram hours. At six-week intervals subsequently radium tubes were again applied in each nostril for three-hour periods. On January 3rd, 1922, there was little evidence of disease, but a prophylactic treatment of a 10-milligram tube of radium for one hour in each nostril was given. When the patient reported on March 24th, normal conditions prevailed, with no sign of recurrence. This is the third case of chronic rhinitis which has been treated with radium with curative results.—*The Radium Institute, 134 Bloor St. West.*

A CASE OF PRIMARY SARCOMA OF THE MEDIASTINUM WITH HÆMOPTYSIS AND METASTASES EXTENDING INTO THE LEFT LUNG AND WITH INVOLVEMENT OF RIGHT SUPRACLAVICULAR GLANDS

Keith Gordon, M.D.

Senior House Officer, Montreal General Hospital, Service Drs. Lafleur and Peters.

M. G. H.—3,178—22.—A white unmarried female, age 63 years, housemaid by occupation, was admitted to the Montreal General Hospital, to the service of Dr. C. A. Peters, on June 21st, 1922, complaining of a dry cough, shortness of breath, loss of appetite and night sweats. There was a history of two attacks of acute rheumatic fever some years previously, and a questionable attack of pneumonia fourteen months before admission.

Present Illness.—Patient began to lose weight one year previous to admission but remained at work until four months ago when she developed a non-productive cough, shortness of breath, and profuse perspiration, which had all gradually increased in severity up to the time of entering the hospital.

Physical Examination—(on admission).—There was evidence of considerable loss of weight. The cervical, axillary, and inguinal lymph nodes were palpable on both sides but not enlarged.

The maximum cardiac impulse was palpable in the 5th left interspace in the mid-clavicular line. The deep cardiac dullness extended 2 cms. to the right and 11 cms. to the left of the midsternum. A soft blowing systolic murmur was audible at the apex transmitted into the axilla. There was dullness with diminished vocal fremitus, vocal resonance, and breath sounds over the whole of the left side in front. The left axilla, back and the whole of the right side were clear. The mediastinum was resonant. No improvement was noted during the month following her admission. Physical signs simulating those of fluid occupying the whole of the left pleural cavity had developed, with little cardiac displacement. By the end of the second month a flat note was noted over the whole of the left side of the chest, with dullness over the lower three-fourths of the manubrium; the supra-clavicular lymph nodes on the right side were enlarged; there was marked stridor, and a whispering voice due to a paralysis of the left vocal cord. The patient expectorated a few drachms of bright blood-tinged sputum at intervals; had continuous profuse perspirations; the temperature was of the remittent type; the leucocyte count remained steadily about 12,000. She gradually lost weight and strength until she died sixteen months after the onset of illness.

On admission, x-ray examination of the chest showed the presence of a fairly dense homogeneous shadow occupying the lower two thirds of the left chest densest around the root of the lung, and obscuring the left half of the diaphragm. The right hilus was enlarged and blurred. There was slight cardiac displacement to the right. In six weeks this shadow had extended and occupied the entire left chest; there was a slight displacement of the heart and trachea to the right. Practically the same picture was shown three weeks later.

Discussion.—The findings in favour of an intra-thoracic tumour were: increasing dullness which led to a flat note over the whole of the left side of the chest and manubrium with practically no cardiac displacement; the apparent metastatic invasion of the right supra-clavicular lymph nodes; cough and general character of the sputum; the x-ray picture; paralysis of the left vocal cord; pressure on the trachea.

Some weeks before death a positive diagnosis of intra-thoracic tumour, probably sarcoma, was made. The diagnosis was confirmed at the post mortem, when a small round cell sarcoma was found occupying practically the whole of the left chest which had given rise to the marked enlargement of both lung and mediastinal lymph nodes. The left recurrent laryngeal nerve was embedded in the tumour tissue and the trachea was narrowed by pressure. There were no metastases outside of the pleural cavity with the exception of the supra-clavicular lymph nodes on the right side.

Differential Diagnosis of Diseases of the Mediastinum.—To promote greater assurance in the differential diagnosis of the different infections of mediastinal disease, am accurate knowledge of the mediastinum and of the physiology of its structures, John Phillips, Cleveland, says, is of primary importance. For the establishment of the diagnosis, the resources of the clinical and rœntgenologic laboratories should be called into service, their findings being added to those of a painstaking physical examination and searching anamnesis. It is only by relating the general characteristics of the various types of diseases which may invade the mediastinum to all the clinical findings in the individual case that an accurate diagnosis may be established. Most of the clinical phenomena associated with pathologic conditions in the mediastinum result from pressure on some one or more of the important structures contained in it. It is therefore an important aid to diagnosis to be able to relate the symptoms in an individual case to the structures which are primarily involved. The importance of a careful and searching inquiry into the history of a patient in whom disease of the mediastinum is suspected cannot be overestimated. The physical examination should be complete, and should include a neurologic examination. A rectal examination should never be omitted. If any doubt regarding the diagnosis remains after a careful physical examination of the chest, either a fluoroscopic examination or roentgenograms of the chest should always be made. Excluding aneurysm, tumors of the mediastinum form the most interesting and the most important group of diseases of this region. These may be primary or secondary, malignant or benign. Almost every type of tumor may be found in the mediastinum. Simple mediastinitis, in which there is a low grade of inflammation of the mediastinal tissues without suppuration, sometimes occurs. Suppurative mediastinitis is always a serious disease. It is most commonly associated with tuberculous disease of the mediastinal glands, and the tracheal and bronchial glands are most frequently affected. Mediastinal emphysema may occasionally result from inflammatory conditions in the mediastinum, the air gaining access into the mediastinum from a perforation of the trachea or bronchus, or making its way from the neck beneath the deep cervical fascia.—*Jour. Am. Med. Assoc.*

Editorial

INSULIN AND THE STEPS TAKEN TO SECURE AN EFFECTIVE PREPARATION

IN the year or so that has elapsed since Banting and Best discovered that a saline extract of the residue of the pancreatic tissue remaining some weeks after ligation of the ducts is capable of causing a decided fall in the percentage of blood sugar and in the excretion of sugar in the urine in diabetic dogs, considerable progress has been made in determining the significance and clinical application of the discovery. J. B. Collip, taking advantage of an observation of Banting and Best that the active principle is soluble in alcohol, succeeded in preparing an extract called insulin (a name first suggested by Sir A. E. Schafer) that is practically protein free, and entirely non-irritant on subcutaneous injection, thus making possible its repeated administration to diabetic patients. It was by the use of this extract that these investigators in collaboration with W. R. Campbell and Almon Fletcher showed the clinical value of insulin. Although preparations of insulin of high and tolerably constant potency were readily obtained on a small laboratory scale, attempts made in the Connaught Antitoxin Laboratories of the University of Toronto to produce large quantities were immediately met by great difficulties. For over two months, even although the original method was strictly followed in every detail but on a much larger scale, no yield of active extract could be obtained. In the light of this experience it seemed important before publishing the method of preparation of insulin to take steps to ensure that a satisfactory product should be furnished to the medical profession. This view was greatly strengthened when it was found in the investigations on animals that toxic symptoms of an alarming nature may supervene when an overdose of insulin is given, thus making it imperative to have its dosage and its clinical usefulness thoroughly investigated on a large scale in specially appointed diabetic clinics before it came to be used extensively in general practice. It was realized that if the method of preparation were published in detail the market would soon become flooded with pancreatic extracts that were either entirely inert in their effect on carbohydrate metabolism, or, if active, were of uncertain potency, and that no definite directions could be furnished as to the proper dosage for treatment in the various types of diabetes.

With the above mentioned objects in view patents for the preparation of insulin have been applied for in Canada, the United States and Great Britain, and the applicants have formally offered to hand over the patents when granted to the University of Toronto. This trust has been accepted on the understanding that the patents shall be employed for the sole purpose of safeguarding the production of insulin against commercial exploitation, and to ensure that a product of tested potency be furnished to the profession in the shortest possible time. To advise it in the administration of this trust the University has appointed a committee composed partly of those in Toronto who participated in the researches by which insulin was discovered, and partly of representatives of the Board of Governors. The method by which the University intends to fulfil these conditions is to license approved manufacturers to produce insulin under the patents subject to their satisfying the University, by frequent submission of samples of their product, that it is of adequate potency and purity. To maintain a laboratory and staff to undertake this testing a nominal royalty will be charged the licensees and if the income from this source should exceed these requirements the surplus will be used exclusively for research in similar or related fields. It should be understood that the original applicants for the patents will receive no monetary return from the sales.

In view of the difficulties encountered in the Connaught Laboratories in producing insulin on a moderately large scale, which have already been referred to, it was decided that it would be unwise to issue licenses to any extent until after further experience on a much larger scale of production had been acquired. Since this involved the use of a larger commercial chemical equipment and access to a much greater quantity of slaughter house material than could be found in Toronto it was decided to collaborate with some suitably equipped firm that would agree to devote all its available developmental energies to producing insulin on a large scale, and would at the same time supply suitable samples of their product during the experimental period to certain physicians and clinics chosen by the Toronto authorities, to report on its efficiency in the treatment of diabetes. The reports of these specialists are being submitted to the collaborating company and to the University authorities, and they are proving invaluable in controlling the efficiency of the insulin, as well as in indicating the extent of its usefulness in the different types of the disease and in matters of dosage.

This collaboration with one firm will be continued until there is every reason to believe that a product of standard potency and non-toxicity can be manufactured with certainty. In the few months during which the collaborative experimental production has been going on, unexpected complications have arisen from time to time, and it is certain that if licenses were granted other manufacturers at present, these same difficulties would be experienced by them, and the purpose of the control by the University would be frustrated.

How long it will take before insulin can be supplied to the general practitioner, cannot be determined at present. The supply is rapidly increasing, and it is hoped that sometime during the first half of 1923 the experimental period will be ended. Since it would be very difficult for the University of Toronto to control the manufacture of insulin in the British Isles in the manner described above for Canada and the United States, it has offered the patent rights for Great Britain to the Medical Research Council to administer as it deems best for the purpose of safeguarding the manufacture of insulin in that country.

It is not the object of this editorial to discuss the clinical uses of insulin, but it may not be out of place to state that these have exceeded the wildest anticipations at least in certain cases. It will probably never entirely replace careful dietary regulation, but it is undoubtedly of great value in assisting the weakened power to metabolise carbohydrate. This enables much more of this important class of foodstuffs to be included in the diet with the result that the bodily nutrition is improved, the subjective condition of the patient greatly bettered, and the power of resistance to accidental infectious materially raised. At present insulin must be given subcutaneously, usually in 2 or 3 cc. doses twice daily, but there is some reason to hope that other methods of medication may soon be discovered. Unfortunately it cannot be given effectively by mouth.

J. J. R. Macleod

THE PHYSICIAN IN INDUSTRY

THE Conference Board of Physicians in Industry, a committee of the National Industrial Conference Board of the United States, has recently adopted the following definition of the Physician in Industry:

"The physician in industry is one who applies the principles of modern medicine and surgery to the industrial worker, sick or well, supplementing the remedial agencies of medicine by the sound application of hygiene, sanitation and accident prevention; and who, in addition, has an adequate and cooperative appreciation of the social, economic and administrative problems and responsibilities of industry in its relation to society."

By this step an important service has been rendered in connection with clarifying the ideas of people generally about the functions of those members of the medical profession who are engaged in industrial health work. It is, furthermore, most timely that a distinction should be made between present day physicians in industry and those of an earlier vintage whose chief duties were to dispense a few pills and patch up minor injuries occurring in the plant; which functions were usually performed with as little inconvenience to themselves and as small expense to their employers as possible.

The definition makes it clear that the industrial physician must have a good general education, a thorough professional training, a high moral character and no small amount of vision, judgment and tact. He must be conversant with the fundamentals of industrial relations, plant organization and operation, safety engineering, employment psychology and methods, fatigue problems, sanitation, housing, pension plans, social insurance, recreational activities, etc., in addition to those matters directly related to modern medical and surgical practice. He must be prepared to assume responsibility in connection with the prevention as well as the cure of disease and have a true conception of the obligations of industry to its workers and through them to the community and the nation.

To the physician in industry there is open a wide range of interests in behalf of national progress and human betterment which are at once a challenge to his resourcefulness, human insight, constructive imagination and spirit of citizenship.

B. L. WYATT

THE EARLY DIAGNOSIS OF PERTUSSIS

PERTUSSIS is at the present one of the commonest of the acute infections of childhood, and at the same time one of the most difficult to recognise in its early stages; the stage at which our present methods of treatment give us the best results. We therefore welcome the preliminary report of Dr. Ordel of the Mount Sinai Hospital, New York, who states that he has obtained excellent results in the early diagnosis of the disease by the intradermal injection of a vaccine of the Bordet-Gengou bacillus prepared by a special method and used similarly as in the Schick test for diphtheria. Several attempts were made to obtain an effectual vaccine without success. Definite results, however, were finally secured by using a vaccine containing two billion Bordet-Gengou bacilli per cubic centimeter. The technique in making the test is the same as in the Schick test, using this pertussis vaccine instead of the toxin of diphtheria. The upper portion of both forearms are cleansed; two minims of sterile saline solution are then injected into the upper portion of the right forearm intradermally as a control; while into the upper portion of the left forearm are injected in the same way two minims of the pertussis vaccine. The first examination of the arms should be made in the course of four to six hours after the injection is made; subsequent examinations should be made at 24 hour intervals for one week. The initial tests were made in the pediatric clinic at the Mount Sinai Hospital. Three groups were tested, the children varying from four weeks to nine years. The first group consisted of children who it was definitely known had been exposed to the disease. This group contained twenty-five children. Of these twenty-four gave a definite reaction manifested by a reddened area varying in size from 5 to 25 m.m., painful and slightly raised. The one exception was a boy who had been repeatedly exposed to the disease but had never contracted it. The second group consisted of fifteen children of varying ages suffering from various complaints but among whom no cough was present, nor so far as could be ascertained, had they ever had whooping cough. Two of these gave a slight pseudo-reaction, that is, an area of redness less than 5 m.m. in diameter; the rest were all negative. Two months afterward, these children on accidental exposure to the disease, were re-tested while in the catarrhal stage and gave a strongly positive reaction. A third group consisted of fifteen children, all of whom were suffering with bronchitic coughs, but no one of whom had had whooping cough or had been lately exposed to it; all tests of this group were negative. Dr. Ordel states in conclusion that, although one is not justified in drawing absolute conclusions from so small a number of cases, yet the results obtained appeared to hold forth the hope of the possibility of an early diagnosis in this very troublesome disease.

TREATMENT AND PREVENTION OF DIPHTHERIA

THE British Ministry of Health has issued a small pamphlet on diphtheria (*Brit. Med. Jour.*, Sept. 9, 1922), emphasizing some of the important points in regard to this disease which at this time of the year is liable to make its appearance in various parts of the Dominion. It directs that in every case, where a provisional diagnosis has been made, a dose of at least 8,000 units should be injected as early as possible without waiting for a bacteriological confirmation of the diagnosis. The injection may be subcutaneous or intra-muscular; the latter is to be preferred as absorption takes place more rapidly when a case is seen early in the attack. This amount is generally followed in twelve hours by signs of definite improvement, in which case no more antitoxin will probably be necessary. If, however, the disease appears to be advancing a second dose of the same amount should be given, and this may be followed by a third if no distinct improvement occurs. There is no evidence that antitoxin has any value in causing the disappearance of the bacilli in the case of a chronic carrier, and it should not be administered to any person with no local signs. In the opinion of this Health Board a prophylactic dose is rarely necessary for "contacts" if they can be kept under daily observation, and if antitoxin can be administered promptly should any sign of the disease develop. This is especially true of adults. Should a prophylactic dose be deemed necessary the amount required is 500 to 1,000 units. To determine whether or not healthy persons possess a natural immunity to this disease, the Schick test may be employed. This test consists in injecting into the skin about three minims of a freshly made dilution of standardized diphtheria toxin, and as a control into the opposite arm a similar amount of the same solution previously heated to destroy its activity. If the reaction is positive indicating a susceptible individual a circular area of redness will appear round the site of injection in twenty-four hours and persist for four or five days. In susceptible individuals showing a positive Schick reaction active immunity may be induced by inoculation of "toxin-antitoxin;" i.e., a carefully standardized mixture of diphtheria toxin and protective serum. Three separate inoculations of 1 c.cm. should be given at intervals of a week; in adults such injections may be followed by a local reaction or mild constitutional disturbance. The immunity takes some time to develop to its maximum, which is reached in a period of from two to six months, and has been shown to persist for more than six years. Such active immunization is especially valuable for protecting susceptible individuals who are likely to be exposed to infection; because of the slow development of the immunity the work of active immunization should be carried out in inter-epidemic periods.

ALCOHOL AND INDUSTRIAL EFFICIENCY

A SYMPOSIUM on the relation of alcohol to certain social problems took place during the last annual meeting of the British Medical Association, at which several interesting papers were read. The first paper presented was on Alcohol and Industrial Efficiency, in which Dr. Collis claimed that the effect of alcohol on both physical and mental activity was only depressing, interfering with the return the labourer was able to render for wages paid and lowering both the quality and the quantity of his output. Bodily activities were of two kinds; reflex and volitional. As the result of careful experiments it had been shown that after the ingestion of an amount of alcohol equal to two ounces of whiskey or a pint of beer, the knee jerk was retarded, and the extent of the reflex movement diminished by about one half. With any increase in the amount taken, both the promptness of the reaction and its amplitude were impaired. Direct proof of an interference with industrial efficiency from such impairment of the reflex may be difficult to bring forward; but indirect evidence of impairment may be found in the occurrence of accidents, many of which are the result of such impairment. Throughout Germany, Great Britain, and in the United States before prohibition, the number of accidents which occurred on Mondays and after holidays was greatly in excess of those which occurred on other days of the week, the inference being that this increase was due to the effects of alcohol. It is claimed that this heavy increase of casualties after holidays, has been quite done away with in the United States since the enforcement of prohibition.

In reference to volitional acts Mellanby's work indicates that alcohol is not a source of energy for muscular contraction. This is important. If combustion of alcohol only supplies heat to the body and not energy for the contraction of muscles, any claim is removed that alcohol is of use to the industrial worker on account of its value as a partial food. The influence of alcohol upon the nervous tissues has received attention from several observers. Quite a moderate dose, such as a glass of wine or a pint of beer was invariably followed by a reaction in the direction of a diminished control of the muscles. During the experimental work a point frequently noted was that workers when under the influence of a slight amount of alcohol had always the impression that their work was being performed unusually quickly and accurately, and could with difficulty be convinced to the contrary, even when faced with the results. Interference with industrial efficiency through lost time appears to be also markedly influenced by alcoholism. Lost time varies greatly in different industries. Those in which it ranks high are all industries in which convivial drinking is frequently excessive. Nevertheless it must also be remembered that fatigue engendered by hard physical work or adverse conditions of employment may be a direct inducement to the use of alcohol; thus work associated with severe strain may tend to increase the alcoholic habit, and this in turn acts detrimentally upon the amount of lost time. Investigations carried out establish the fact that a day of recreation is frequently more fatiguing to the labourer than a day of work, and that this unfortunate result of recreation is most pronounced among the class who are habitual drinkers.

Another cause of impaired efficiency is labour turnover; while no evidence is forthcoming from England as to how labour turnover is influenced by alcoholism, evidence from many firms in the States is to the effect that since prohibition became law their labour turnover has been greatly reduced. The true test, however, of industrial efficiency must be the amount and quality of the work done, and here for lack of evidence from other sources, appeal must be made again to America; reports made by many firms representing different industries affirm that the work done has been much increased; many companies maintaining that their men are worth 20 to 50 per cent. more on account of their ability to give better service.

Alcoholism affects industrial efficiency indirectly through another channel. The energy needed for industrial efficiency is obtained from food, and in those in whom the alcoholic habit prevails, the appetite is interfered with and wages are spent on drink which should be spent on food. Interest therefore attaches to the relative expenditure in the United Kingdom on food and on alcohol. The comparative figures in 1919 were as follows: Sixteen pounds sixteen shillings per head on food, and eight pounds on beer and spirits; almost half as much on alcoholic drinks as on food. Manual labourers who expend energy and need more food unfortunately spend proportionally more on alcohol than do non-manual workers, and the efficiency of their work suffers. Alcohol, however, undoubtedly possesses a great charm for removing the irritating effects of industrial fatigue, but it is a charm purchased at a great cost to efficiency.

In the discussion which ensued Sir Thomas Oliver claimed that during the last fifty years all classes of society in England had been marching towards sobriety. There were certain occupations, however, in which manual labourers were tempted to drink more heavily. Occupations which had to be carried on at high temperatures or in humid or dusty atmospheres tend to increase thirst, and thus induce a desire for drink. In some persons, alcoholic drinks induced degenerative changes more rapidly than in others, but it must be remembered that from these degenerative changes total abstainers were not altogether exempt. Experiments on animals also prove that alcohol acts as a racial poison, adversely affecting both the ovum and the sperm; although from the nature of the case it is more difficult to adduce direct proof of a similar effect in the human subject. At the close of a long discussion a motion was passed unanimously "That the Council of the British Medical Association be requested to assist in the promotion of further inquiry into the effect of alcohol taken as a beverage on the individual and on the community."

REFLEX COUGH IN BRONCHOSCOPIC WORK

AT the present season of the year, no symptom is more frequent and more irritating than cough, which has been defined as an involuntary act reinforced by volition. James Mackenzie in his work on Symptoms and their Interpretation, states that in affections of the lung, cough arises only when the secretion has been carried by the contractions of the bronchial muscles and by the cilia of the respiratory tract so far upward as to reach the sensitive region about the larynx. Unquestionably the cause of cough is an irritation in the area of the distribution of the glossopharyngeal, the trigeminal and perhaps some other sensory nerves. In the purely reflex cough local irritation develops nerve impulses, which may be transmitted by the vagus nerve. Both physiologists and clinicians appear to have overlooked the fact that a condition of tolerance may under certain circumstances be quickly established, which lessens and sometimes entirely obliterates temporarily the reflex excitability of the mucous membrane of the respiratory tract. In certain toxic conditions, notably that of influenza in children, the cough reflex may be entirely absent. In some cases the absence of this cough reflex according to Dr. Jackson, has led to the patient drowning in his own secretion. Dr. Jackson adds to our knowledge facts regarding the reflexes from this respiratory tract which he has discovered by the use of the bronchoscope. An interesting observation regarding deep bronchoscopic work in the lung is that in some cases it can be carried on without sedatives and without anæsthesia, local or general, as tolerance is acquired by the mucous membrane after a few minutes contact of the tube with the mucosa; the cough present at the first introduction is not re-excited except the tube is passed on to a new area of the mucosa. Dr. Jackson states that so far as he is aware no distinction has hitherto been drawn between the cough made by the mere presence of a foreign body in the bronchus and that produced by the secondary pathological changes set up by the foreign body. Such a distinction is important when it is recalled that with normally active reflexes, the presence of secretion in excess of the normal mucosal moisture will excite the cough reflex for purpose of expectoration. There is, however, a great variation in the extent of the pathological irritation and amount of secretion produced by foreign bodies, due to the nature of the foreign body, and to the amount of obstruction and to drainage and aeration resulting from the size, shape and location of the foreign body. In the case of a foreign body in one of the air passages its first contact with the tracheal bronchial mucosa sets up violent coughing. The cough in the case of foreign bodies not derived from the vegetable kingdom quickly subsides if the foreign body remains fixed in one place, but if it is moved about either by movements of respiration or coughing, severe spasmodic coughing will again ensue. If the foreign body is non-obstructive and of a metallic nature little or no cough may develop for weeks or months until secondary inflammatory changes have resulted in pus formation. Vegetable substances, however, even when not moveable quickly excite severe and frequent coughing attacks, and a muco-purulent or purulent secretion, necessitating cough for expectoration purposes. While the entrance of a crumb of bread into the larynx may bring on a severe strangling cough it is often amazing to note the tolerance that ensues on the prolonged presence of a foreign body, and Dr. Jackson quotes a case in which a cockleburr was lodged in the larynx of a man for twenty-four hours, the spasm associated with severe coughing and vomiting lasted fifteen minutes after which there was no cough, only loss of voice, and a desire to clear the throat. In the case of foreign bodies in the œsophagus a cough frequently ensues, due to a secondary laryngo-tracheo-bronchitis, from overflow into the larynx of secretions which should have passed down the œsophagus.

Dr. Jackson insists that there is no bronchoscopic evidence to show that the respiratory mucosa is more sensitive in some places than in others. On the other hand the finer subdivisions of the bronchial tree which can be entered only with a slender instrument appear distinctly less sensitive and the peripheral areas show no cough reflex unless the proximity of the visceral pleura is irritated.

Editorial Comment

CANCER WEEK

Cancer is one of the last strongholds of disease to hold out against the men of science. It is a perpetual challenge to man to pit his intelligence against a malignant power. Smallpox has succumbed to the vaccine of Jenner; tuberculosis, the great white plague, shows a lessening death-rate, as research finds new prophylactic and curative methods, while typhoid, diphtheria and other scourges have their antidotes and are no longer the dread of the physician. Yet the death-rate from cancer continues to increase. An expert statistician has stated that one male in every twelve over the age of forty has cancer in some form or another and one woman in every eight, while Dr. Robert Bell, the vice-president of the International Society of Cancer Research is authority for the statement that if the present death-rate from cancer is allowed to go unchecked no fewer than 25,000,000 people out of the present population of the world must die of the disease. Professor Tuffiers in an address to the French Academy of Medicine, states that cancer takes a toll of 500,000 annually. The mortality due to cancer is now stated to be three times higher than it was fifty years ago. This in mockery of the patient work done by the research bureaus and by investigators in all parts of the world. A special week was set apart on this continent as Cancer Week. The object of appointing this special week for consideration of the subject of cancer was two-fold. First, to draw attention to the high death rate and secondly to emphasize the importance of early treatment. The campaign conducted under the auspices of the American Society for the Control of Cancer was international. Early diagnosis of the disease affords the only immediate prospect of bringing about a decline in the death rate which is advancing at an alarming rate. Medical experts, doctors, and surgeons assert that in the employment of prompt removal lies the one hope of cure and they are confident that this campaign over the Continent will prove its usefulness, particularly if followed up by continuous educational propaganda. Their aim is not to spread alarm about cancer, but to bring hope. George Hall

ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION

Preliminary Notice

The Annual Meeting of the Canadian Medical Association will be held in Montreal on June 12th, 13th and 14th, 1923.

The Headquarters of the Association will be at the new Mount Royal Hotel, where one floor of this commodious structure will be placed entirely at the disposal of the Association. Excellent accommodation has been arranged for all the General and Special Meetings, and the accommodation for all desirable exhibits will be far superior to anything that has ever been obtained before for this purpose in Canada.

Arrangements have been also made for the meetings of the various other associated societies, and a very large attendance is anticipated.

One of the features of the meeting will be the presence of Sir Berkeley Moynihan, of Sir William Taylor, President of the Royal College of Surgeons, and of Sir Robert Jones, the well-known authority on Orthopaedic Surgery; Dr. W. J. Mayo, of Rochester, Minn., has also promised to be present. Addresses and clinics will be given by these gentlemen during the meeting.

The programme which is now being prepared will include clinics at the various English and French hospitals during the second and third mornings of the meeting, while during the afternoon, there will be a presentation of papers up to four o'clock only. In this way, time will be given to the members for independent activities.

Daily luncheons will be held at the hotel, during which the business of the meeting will be in part transacted and short addresses will be given by important visitors.

A banquet will be held on the evening of the 13th June. Special arrangements are being made by the Entertainment Committee to carry out a programme which it is hoped will be of interest to the members and to the ladies who may accompany them.

Men and Books

ROMAN SURGERY IN THE TIME OF CELSUS

In a recent article in the *Caledonian Medical Journal* Mr. A. Don has given us an interesting report of Roman work in the first century relying for his description of it chiefly on the works of Celsus. Celsus, sometimes called the Roman Hippocrates, wrote not only on medicine, but on rhetorics, philosophy, law and the art of war, but as he was a Roman citizen considered it beneath his dignity to practise the healing art, which was at that time chiefly in the hands of Greeks and slaves. Mr. Don after a critical examination of the works of Celsus shows how well versed Celsus was in surgery, so well that he must have watched very closely the operations of others, and perhaps occasionally operated himself. Celsus divided medicine into pharmacology, dietetics, and surgery, remarking that surgery does not reject the other branches but effects most by the hand. Physicians at this period included in their practice all diseases except those in which the surgeon had to make the first wound, or where manual operation was essential. The physicians, however, were the bleeders, blood letting being a reputed panacea, sometimes beneficial, seldom dangerous, and always lucrative. Mr. Don brings forward examples to show that surgical practice was often on lines which might be approved of, even by modern surgery. The Roman method of extracting weapons and other foreign bodies was practically the same as our own; cysts were excised without opening the sac if possible; tonsils were enucleated according to the method employed in our best clinics; and catheterisation was performed in a manner that would do credit to a modern professor. After pointing out that trephining was practised in almost all fractures of the vault, the dura mater being left intact if possible, as was the procedure during the recent war, Mr. Don remarks, "Celsus would have made a model surgical specialist in a hospital in France." He was well acquainted with conditions met with in hernia of the brain and with depressed fracture and advocated trephining on the opposite side in contrecoup. The more common dislocations are well described by Celsus who in general follows the teaching of Hippocrates. His symptomatology of dislocations of the head of the femur is nearly as accurate and full as the well-known description by Sir Astley Cooper.

THE MEDICAL HISTORY OF THE WAR

The Medical History of the War based on official documents, and edited by Sir W. G. Macpherson, K.C.M.G., with the assistance of Sir W. P. Herringham, K.C.M.G., Colonel T. R. Elliott, D.S.O., F.R.S., and Lieut-Col. Andrew Balfour, C.B., C.M.G., is in course of publication. Nine volumes are promised. The first two deal with diseases met with in the war. Sir William Macpherson is to be congratulated on the appearance of the several volumes which already have appeared. Other volumes in preparation will deal with Hygiene, with Pathology and Medical Research, and with Medical Statistics and Epidemiology in the war. The articles are written in an interesting manner and while presenting a picture of the state of our knowledge, emphasize the measures adopted in the war for the treatment of disease and for minimising the resulting invalidism. Some chapters in the history of the Medical services will probably never be officially chronicled. The failures and the difficulties are not set forth in these volumes. Possibly some future memoir may lift the curtain from some of the most important episodes. Posterity may not be particularly interested to know who was responsible for the inadequate ration in Mesopotamia that produced the beri-beri. It will be enough to know what the ration was that abolished that invaliding affection. It is immaterial from a scientific point of view to know who selected the malaria infested terrain of Macedonia, but the experience gained should bear fruit in the future. The impression left after reading these volumes is that it is the minor and avoidable ailments that cause the greatest wastage in an army. Science has robbed many of the worst scourges of an expeditionary army of their dreaded dangers. The most notable example is that of enteric fever from which inoculation has proved capable of rendering whole armies immune. In the South African war the admission rate for enteric fever was 235 per 1,000, and the death rate 36 per 1,000 of the rank and file in the British army. In France in 1918, the comparable figures were an incidence rate of 0.12 per 1,000, and a death rate of 0.007 per 1,000. In Egypt where the disease reached its greatest incidence the figures were 17.35 and 0.32 respectively. Certain diseases left our troops almost untouched, notably typhus of which only 998 cases occurred in the British armies. The only cases of famine dropsy among British soldiers occurred among those who were prisoners in the enemy's hands. An outstanding lesson of the war is to be drawn from figures collected by Colonel Soltau, in France, in 1917, figures which were corroborated again and again by all observers. The total admissions for sickness in one of the armies during a year numbered 106,267; of these 26,879 were due to what were commonly called "skins and scabies", that is to say, twenty-five per cent. of the sick wastage was due to some form of skin disease largely preventable by careful inspection and by personal cleanliness of the men; the corresponding figures for seven weeks observed in 1918 in another army amounted to between eighteen and twenty-four per cent. each week. In addition to this group of "skins and scabies", there was a group consisting of pyrexia of uncertain origin, trench fever, myalgia, and rheumatism, the cause of which was undoubtedly in the majority of cases louse-borne. That accounted for another 25,000 admissions so that of all the casualties from sickness nearly fifty per cent. were attributable to dirt and vermin. The editor-in-chief draws four great lessons from the reports and statistics of the war. 1. The importance of cleanliness must be recognised; an army to be efficient must be kept clean. 2. The value of original research in the field must be recognised; an efficient army must carry its medical research units with it. 3. The general staff must take wastage by sickness into account as much as wastage by wounds; an army to be efficient must have medical plans, no less than military plans before embarking on a campaign. 4. Hospital treatment in the field must not be rough and ready; the clinical medicine and surgery of wartime is susceptible of a high degree of perfection and affords scope for the finest scientific work.

A Simple Non-operative Method of Treating Gastric Ulcer.—Besides the withholding of food and rectal alimentation, Albert A. Epstein, New York, resorts to continuous irrigation with distilled water warmed to body temperature or even a little higher, then coloured with a saturated solution of congo-red (1 c.c. to the gallon). The congo-red serves as an indicator of the presence of hydrochloric acid in the stomach, which manifests itself by the blue colouration of the return fluid. The irrigation should be continued until the return fluid is of the same colour as the irrigating fluid. If solid particles are present in the return fluid after all the acid has been removed, the irrigation should be continued until they are no longer present. The inflow is then stopped; but the suction is continued until all the irrigating fluid has been removed from the stomach. Fifty cubic centimeters of a 0.5 per cent. colloidal iron solution is then allowed to flow into the stomach, and permitted to remain there. The tubes are then withdrawn and the treatment is complete. The patient is permitted to rest for two hours. The colloidal iron is given for the first three days only, or longer in cases when no food is given by mouth. In the two hour interval between treatments, a five per cent. glucose solution is administered by the rectal drip method. Each period of irrigation, followed by the instillation of colloidal iron, constitutes a treatment. The number of treatments which it is possible to carry out in the course of a day is somewhat variable, and depends on a number of circumstances. From the experience thus far gained by Epstein the number of treatments need not exceed four, but, for proper efficacy, no less than two should be given daily. The total duration of the treatment is from two to three weeks. In the first week, the maximum number of irrigations are given. Subsequently, the number is gradually reduced, and so timed as to fit in with the feeding of the patient. The relief which the patients have obtained by this method of treatment is said to have been very striking. Whether the results thus obtained will prove to be permanent requires further observation.—*Jour. Am. Med. Assoc.*, October 14th, 1922.

Abstracts from Current Literature

MEDICINE

On the Physiology of the Gall Bladder. Auster, Lionel S., and Crohn, Burrill B. *Amer. Jour. Med. Sci.*, Sept., 1922.

The interest in the gall-bladder which has been stimulated both by its surgical removal, as well as by non-surgical drainage, lends added importance to the work of these writers. A very complete study of the anatomy of the gall-bladder, as well as its experimental physiology, has led to conclusions which are distinctly new.

According to the views of these writers, the gall-bladder is, after all, not the actively functioning organ that we have been taught to regard it. It probably does not rhythmically fill and empty itself under the stimulus of digestion. Normally the liver bile has free ingress into the gall-bladder and at times there may be an enormous concentration of bile (inspissation) in the bladder itself, with the addition of a mucous element. How or at what rate the emptying of the gall-bladder occurs is a point of contention. The work hitherto done by physiologists in this connection has been carried out by means of pyloric or duodenal fistulae, and the variations in the bile flow with reference to digestion have been rather *presumed* to follow and to depend upon the filling and emptying of the gall bladder.

The authors believe, on the contrary, that the flow of bile originates in the liver and sweeps down the ducts into the duodenum, disregarding in the main part, the gall-bladder. Such variations in bile flow and concentration as occur originate in the liver in answer to the various degrees of food stimuli. The authors seem to have proved that the gall-bladder as an active organ does not enter into the physiology of bile excretions; it has not the ejaculatory mechanism or the proper musculature for such a function in the same light as one speaks of the urinary bladder. The outflow from the gall-bladder is rather in the nature of an over-flow incontinence. Under pathological conditions, the gall-bladder is capable of great distention, acting then as an exhaust vent and safety valve to relieve intraductal pressure. Such a function is complimentary to its great capacity to concentrate the bulk of bile by dehydration and inspissation. C. F. Martin

The Effect of Saline Purgatives on the Absorption of other Drugs. Macht, D. I. and Finesilver, E. M. *Johns Hopkins Bulletin*, Sept., 1922.

Following a personal experience of one of the authors, a series of investigations were made on the general effect of saline purgatives on the absorption of other drugs. While suffering from an attack of grippe, a full dose of aspirin was used to relieve headache; this had been taken shortly after the use of a saline purgative. The aspirin had no effect. The conclusions formed by the authors after a long series of experiments are summarized as follows:—

The taking of saline laxatives delays absorption from the stomach and intestines of many drugs. This was experimentally shown to be specially marked with phenolsulphonephthalein and sodium salicylate. Other laxatives do not seem to have this effect upon the absorption of drugs from the stomach and intestines; in other words, one cannot expect to obtain from certain medicines the same physiological results if these drugs are used in conjunction with saline purgation. Thus, for example, apart from the use of the drugs above mentioned, it was found that some of the opiates—morphine, pantopon, apomorphine—were all delayed in their absorption. The same held true in the use of strychnine, atropine and quinidine. Digitalis, too, when administered with saline laxatives, was much more slowly absorbed than when the drug was used with water alone. Salol, aspirin and phenazone were similarly delayed, as was also urotropin (hexamine).

The authors likewise draw attention to the usefulness of saline laxatives in the treatment of toxicological cases, where the action of the poison may be delayed and beneficial results may be obtained. C. F. Martin

On the Significance of Pyuria in Children.

Fowler, J. S. *Edinburgh Med. Jour.*, July, 1922.

Pyuria in children is a common condition and usually a troublesome one in that it is hard to overcome. While many cases recover under medical treatment alone, a large percentage require surgical interference.

Acute pyuria is almost entirely limited to female children, and the larger number occur in early infancy. The chronic form of the disease, however, is common in boys. The onset of the disease is usually accompanied by fever, restlessness and indefinite chills. The urine at first contains but little pus; colon bacilli are usually abundant. Later on the pus becomes more profuse. There may be mental irritability suggesting meningitis, and pain in the right abdomen may simulate appendicitis. It is important, therefore, to obtain an uncontaminated specimen of urine and examine it as soon as possible. In the case of females it is better to have a catheter specimen. The great majority of cases of pyuria are due to colon bacilli frequently in association with staphylococci or pneumococci. These organisms, however, in the chronic forms, may be secondary to a tuberculous condition or to a calculus.

Acute cases with mild systemic disturbance may be treated medically. In cases, however, where the condition persists, and there are severe general symptoms of fever, pain in the groin and malaise, the urine should be carefully investigated for tubercle bacilli, and this followed by cystoscopic and x-ray examinations.

The treatment for the acute cases consists of forced fluids and large doses of potassium citrate In the chronic forms, hexamine seems to be the most efficient drug. Autogenous vaccines may in some cases be beneficial. A. H. MacCordick

Studies in Focal Infection.

De Niord, R. W., and Buly, B. J. *Jour. Lab. and Clin. Med.*, July, 1922.

While much excellent work has been done on the relation of focal infections to systemic disease, many doctors and dentists do not as yet accept the theory. There is, however, overwhelming proof, both clinical and experimental, that the same organisms are found in the secondary lesions as in the primary foci. While the tonsils hold first place and the teeth second as areas of primary infection, all sinuses communicating with the mouth may be seats of pus collection or degenerated cell accumulations. From these may arise almost innumerable secondary affections of nervous, bony or muscular tissues, resulting in gastro-intestinal, renal, pulmonary or cardiac disturbances, or in some involvement of the special senses, or even maintaining an irritation which may predispose to malignancy.

The mouth is not only a place of easy entrance for bacteria but also often forms an environment where they acquire a peculiar virulence. In the presence of focal infection it is now known that certain blood changes take place by means of which it is possible to arrive at a diagnosis in cases in which the primary lesion is obscure. A constant finding is an increase in the uric acid content, which is a direct metabolic product of the decomposition of nucleo-proteins. Uric acid is eliminated slowly by the kidneys, and if produced in large quantities over a prolonged period, tends to accumulate producing uricacidemia.

An increase in the uric acid in the blood may also be induced by a leukaemia and by prolonged x-ray treatment. Excluding such conditions, an excess of uric acid may be considered as strongly indicative of some process of unusual breaking down of cells. It does not point to any particular region, but warrants a careful search for some obscure infection with the discovery and elimination of which a return to a normal uric acid content generally follows.

A. Howard MacCordick

Some Aspects of Mental Hygiene.

Buzzard, E. F. *Mental Hygiene.*, July, 1922.

This very interesting article deals with the influence exerted upon modern conceptions of mental hygiene by the new dynamic psychology. "Psychoanalysis is as necessary for the study of psychiatry as accurate and patient history taking is necessary for the elucidation of medical problems of organic origin." "A great number of Freud's conceptions have withstood all the tests that can be applied to them, and it is not too much to say that they are now firmly incorporated in the structure of our knowledge." Buzzard agrees with Bernard Hart in claiming for Freud's work the opening of a new era in psychology. The principal impediment to the growth of mental hygiene is the fallacious belief in the public mind that so-called functional disorders or "nerves" are not mental disorders. We should be able to speak as frankly about mental disorders as about gastric disorders, and so dispel fear of the unknown. The public should recognize that mental disorders are among the commonest of ills, that we all suffer from them in greater or less degree, and that insanity or madness is an advanced form of mental disorder, and not a dreaded monster arising independently of other conditions. Buzzard makes a strong appeal for teaching students psychological medicine without burdening them with a special course. The student "should learn from any or all of his medical teachers how to recognize and how to investigate cases of mental disorder, and the broad principles of their treatment." We may reasonably hope that the number of victims of mental disorder may be appreciably diminished if modern principles of psychical investigation and psychotherapy are incorporated in general medical knowledge.

Another impeding factor is our tendency to unify our pathogenesis. Take, for example, the nightmare of a child. "We like to think it was due to indigestion. It saves trouble." We are prone to overlook the constitutional element and the psychological content of the child's mind which determined the nature of the dream and the emotional disturbance associated with it. "The multiplicity of factors is a doctrine that as teachers, we should keep constantly before the minds of our students;" as practitioners we should constantly keep it in mind. The writer makes a strong plea for training the function of thinking. not only as a mental discipline but as a psychotherapeutic measure; the effort to think over various questions from many points of view. Such a habit might prove to be a powerful preservative of mental health. "Systematized education in wide thinking," especially in childhood and youth, leads to broadness of view. A rigid school education with a narrow socialistic bias may lead to mental and other conflicts in later life. "It can hardly be disputed that a large factor in present day social unrest is of psychological origin, and that broader education would serve not only mental but social hygiene." A. G. Morphy

ANAESTHETICS

Relation of Anaesthetic to Pulmonary Abscess following Nose and Throat Surgery.

Chipman, C. W. *Jour. Am. Med. Assoc.*, Aug. 12, 1922.

It is the writer's conviction that the percentage of lung abscesses following nose and throat operations is no greater than it was twenty years ago. Of 24 lung abscesses about which he obtained particulars, 20 followed tonsillectomy, two followed submucous resection of the septum, and two followed frontal sinus operations. He quotes Moon who lately published an analysis of 202 cases of pulmonary abscess following operation on the upper respiratory passages. The anaesthetic was ether in 151 cases, local in 39, and nitrous oxide in 8. In 93 of the cases suction was not used during the operation. In discussing the part played by the anaesthetic he draws attention to the large number of deaths which have taken place from local anaethesia during the operation. As to the use of ether he insists on the importance of light anaesthesia so that the reflexes may be present sufficiently to allow of coughing when fluid enters the larynx. He considers that if the head is on a level with the rest of the body, or if it be elevated, the chance of fluid entering the trachea is increased. Another factor favouring lung abscess is any method of operating which causes unnecessary trauma of the tissues, with resulting necrosis and suppuration. Most of the abscesses, the writer thinks, are due to aspiration, though some are due to embolism.

In conclusion, some rules are laid down for the prevention of lung abscess. The most important are: A patient should not be operated on within seven days of an attack of tonsillitis, or where there is acute bronchitis or fever from any cause. Only light anaesthesia should be used. The head should always be down and by suction the pharynx kept free from infective material. The tonsils and pharynx should be painted before operation with 50 per cent. tincture of iodine. Also the cavity should be swabbed with iodine after removal of tonsils. Bleeding should be stopped at once by suture or ligature rather than by prolonged sponging. In all nose and sinus operations a posterior nasal plug should be used. W. B. Howell

The Effects of Ether Anaesthesia on Afferent Paths in the Decerebrate Animal.

Forbes, Alexander and Miller, Richard H. From the laboratories of physiology in the Harvard Medical School. The *Amer. Jour. of Phys.*, September 1st, 1922, Vol. 52, No. 1, pp. 113-139.

The authors quote the histological observations of Crile and Lowel that "Ether anaesthesia offers no protection to the brain cells against the effect of trauma, and that the lipoid solvent anaesthetics probably break the arc which maintains consciousness beyond the brain cells somewhere in the afferent path", also that "the afferent path from the seat of injury being unbroken, the afferent stimuli reach and modify the brain cells as readily as if no anaesthetic had been given". They point out the difficulties that many investigators have experienced in drawing valid conclusions from histological examinations for the simple reason that the variations in a microscopic field of nerve tissue are so great that it is impossible to make a choice of a typical cell. Credit is given to W. B. Cannon for the suggestion that they solve the question by noting the effects of ether anaesthesia upon the electrical disturbance set up after afferent stimulation. They used decerebrate animals with and without anaesthesia, applying stimulating electrodes to a large peripheral nerve and recording with a string galvanometer the disturbance set up in the neurones of the fillet.

The body of this paper shows careful attention to the detail of their work, the description of which is masterly and contains many photographs of galvanometer records, the whole leading up to the conclusion that ether causes a diminution of the electrical disturbance occurring in the brain stem. This diminution increases with the depth of anaesthesia and probably means an increase in the percentage of synapses at which the block is complete. With deep anaesthesia the reduction in the electrical disturbance is very great, sometimes amounting to almost abolition. They conclude, therefore, that very few nerve impulses pass the block established by ether in the first synapsis of the afferent path leading to the brain, and that ether is of great value in protecting the brain from such damage as may be done by afferent impulses. They also point out that their results are in accord with Sherrington's view that the synapse is the point at which the effect of the anaesthetic occurs. WESLEY BOURNE

PEDIATRICS

The Diagnosis and Treatment of Intracranial Haemorrhage in the New-Born.

Munro, and Eustis, R. S. Amer. Jour. Dis. Child., October, 1922.

Intracranial haemorrhage in the new-born is not an uncommon condition in which the mortality is high, and the final results generally most disastrous. The frequency with which cerebral palsies are met with in our out-patient clinics bear witness to this statement.

The anatomical conditions at the time of birth render the cerebral veins extremely prone to laceration. In from twenty-five to forty per cent. of all infants dying in the first week the cause of death is found to be intracranial haemorrhage. Warwick, in a study of 200 necropsies on infants dead within first year of life, gives the incidence of cerebral haemorrhage as nearly fifty per cent. These haemorrhages are grouped by him under three headings according to the causation: (1) Traumatic, from excessive moulding of the head, (2) congestion or stasis with rupture of veins, (3) haemorrhagic disease of the new-born. This classification is commended but the authors would place group (2) under the caption "asphyxia".

In the diagnosis of intracranial haemorrhage three main criteria may be relied upon: (1) The history and physical examination, (2) measurement of the intracranial pressure by spinal manometer, (3) determination of the coagulation and bleeding time of infant's blood. The simplest cases to classify are those due to haemorrhagic disease of the new-born in which intracranial haemorrhage is merely one manifestation of a general pathological condition. This condition may be readily diagnosed by finding an increase in the bleeding and coagulation times of the blood. Depressed and comminuted fractures of the skull are easily recognized, but many cases with a definite history of trauma, present no evidence of any injury. If the cerebro-spinal fluid is found increased and possibly blood-stained, the diagnosis of trauma can be made with probability. The authors believe the largest number of intracranial haemorrhages is due to "asphyxia". This may result from precipitous or prolonged labour, pressure on the cord, etc. The babies are cyanotic, have a feeble cry, do not breathe well and require artificial respiration. One finds at necropsy petechial haemorrhages and congestion of abdominal and thoracic organs, such as occur in adults who have died from suffocation and microscopically punctate haemorrhages throughout the brain.

Asphyxia from whatever cause raises the cerebral venous pressure and produces a venous congestion; this in turn causes an increase in cerebrospinal fluid. Finally one or more of the engorged veins rupture, either in the meninges or in the substance of the brain, or in both.

The symptoms of asphyxia are caused primarily by the intracranial hypertension (acute hydrocephalus) and not by the haemorrhage. It makes little difference whether the haemorrhage is above or below the tentorium. At the end of a few hours or days the baby nurses poorly and has a peculiar shrill cry. Other symptoms such as bulging fontanelles, cyanosis, convulsions, palsies, etc., may or may not be present. Death results from edema and compression of the medulla. The reflexes are quite unreliable in the new-born.

The treatment is based on the pressure of the cerebro-spinal fluid as determined by a manometer. Pressure of 10 m.m. of mercury or more should be regarded as abnormal and should be lowered by lumbar puncture. This procedure is not simple in the new-born. A 14-gauge needle is inserted from one side of the third or fourth lumbar space and directed upwards and inward. If the manometer registers a pressure of more than 18 m.m. of mercury, it is necessary first to reduce the intra-cranial pressure by either a ventricular puncture or a subtemporal decompression. In haemorrhagic disease of the new-born the tendency to haemorrhage must first be checked by the administration of human blood given either subcutaneously or intravenously.

In cases of traumatic origin there may be a massive haemorrhage from rupture of a large vein or sinus. Acute hydrocephalus rapidly develops which may compress the vein and stop the haemorrhage. This hydrocephalus would be fatal unless relieved by lumbar puncture in which case the bleeding will start again and the patient die of haemorrhage. The prognosis of this and the preceding group is, therefore, very bad. Prompt treatment, however, may convert what might have been a spastic idiot into merely a spastic hemiplegic with a normal mentality. The best results are obtained in the so-called asphyxia group. If the increased tension is relieved and kept below 10 m.m. mercury by lumbar puncture the mortality and morbidity are low. If left undiagnosed and untreated permanent danger may result to the central nervous system. The whole question of Little's disease with or without idiocy and epilepsy should be studied anew in the light of our newer knowledge of intracranial haemorrhage. Above all, much can be done to prevent the disease by early recognition and treatment of intracranial haemorrhage in the new-born. L. M. LINDSAY.

DERMATOLOGY

Tinea Versicolor of the Face. Sidlick and Corson. *Arch. Derm. and Syph.*, Vol. V., No. 5, p. 604.

This case is reported because of the rarity of tinea versicolor extending beyond the covered parts of the body in the temperate zone. Mycelia and spores of microsporon furfur were found in the scales from the forehead, face and upper trunk, but cultivation was not successful.

Case report is given showing distribution on anterior and posterior aspect of trunk down to the waist solidly covered, and mascules on buttocks and thighs. The shoulders and upper arms were covered nearly to the elbows. The eruption extended up the neck, face and forehead. The hairy scalp was free. A photograph accompanies the article. W. R. JAFFREY

Potassium Permanganate as a Curative Agent in Dermatologic Diseases. Feldman and Ochs. *Arch. Derm. and Syyh.*, Vol. 6, No. 2, p. 163.

From a suggestion by Dr. Gottheil in his clinic, a case with foul smelling eczematoid lesions on and between the toes was treated with a potassium permanganate dressing. It showed remarkable improvement and was diagnosed microscopically as epidermophyton.

For the past four years the authors have treated a great number of cases with this chemical, and also ran control cases with Whitfield's Ointment deciding that the permanganate results were superior.

Wet dressings of a 1 in 1,000 solution are used chiefly, but it was found that where there is much irritation solutions as weak as 1 in 5,000 are necessary. Exudation and maceration call for a mild application, except in the intertrigenous epidermophytosis on the webs of the fingers and toes, in which cases a pledget of cotton saturated in a 1 per cent. solution applied each 24 hours is most beneficial.

Response to treatment is rapid, but the writers point out that it is wisest to continue for some time after disappearance of the lesions. They found the dysidrotic types the hardest to treat, and they advise keratolytic agents in preparation for the use of the permanganate.

Case reports of the various types treated are given. W. R. JAFFREY

News Items

GENERAL NEWS

Poland Gives Three Crosses.—Echoes of the Great War and the typhoid epidemic of Europe were heard at the office of the Polish Consul-General, November 10th, when three Canadians were decorated with the Cross of Restored Poland. The recipients of the Cross were; Lieut-Col. A. D. LePen, of Toronto, Major C. R. Young, of Toronto, and Dr. John L. Todd, M.D., of McGill University, Montreal. The awards were made by Michel Straszewski, LL.D., Consul-General for Poland in Canada. Among those attending were, Brig.-Gen. C. J. Armstrong, commanding Military District No. 4; P. Emile Naggiar, Consul-General for France; Roman Mazurkiewicz, Vice-Consul for the Republic of Poland, and the Rev. John Drzewiecki, C.R., Minister of St. Mary's Polish Church, Montreal. The crosses to the two military men are the result of the organization in Canada, early in 1917, of the nucleus of the Polish army which fought in the Great War. Under the direction of Col. LePen and Major Young, his assistant, 26,000 volunteer Poles from the United States and Canada were trained and equipped at Niagara-on-the-Lake, Ont., and sent overseas to take their places with the other allied forces on the Western front. After the war these troops did great work against the Bolsheviki. Dr. Todd won the gratitude of the Polish Republic as a result of research work he did in that country at the request of the Canadian Government. Polish authorities claim much of the successful campaign launched against the spread of typhoid in Poland was due to Dr. Todd's efforts. The Crosses were awarded as a result of a decree in Poland on February the 27th last.

We note that the *Canada Lancet* has incorporated the *Dominion Medical Monthly* and the *National Hygiene and Public Health Welfare Journal.* The *Canada Lancet* is an old friend which has done good work in the past and we wish it every success. Let the light shine.

Accept Memorial for Col. McCrae.—The plan for a memorial to the late Colonel John McCrae, in Wimereux Cemetery, in France, for which funds have been subscribed by the Canadian Clubs of Canada, has finally been decided on as acceptable to the Imperial Grave Committee and the family of deceased. The suggested memorial is in the form of a stone seat at the entrance to Wimereux Cemetery. At one side there is to be a house of records; on the other a shelter, both handsome structures. Between these the Imperial Graves Committee suggests that a large stone seat be constructed, a plan being submitted to show just what could be done in this respect. On this seat there would be carved deep in the stone, the verse of Colonel McCrae's poem, beginning, "We are the dead", beneath this verse the name of the author, and concluding with the statement that "Colonel McCrae is buried in this cemetery".

In the bulletin of the Harvey Club of the Western University, London, Ontario, for Oct. 1922, is a short resumé on the question of post-graduate study, there is also included a small detail of the club's existence which should be of interest, namely the presentation of a piece of mahogany obtained from the Harvey home built in Folkestone in the 16th century. The mahogany is to be made into a gavel for the use of the president of the club, and was a present from Dr. T. W. W. Crawford, graduate of the Western University.

At the concluding meeting of the American College of Surgeons on Oct. 29th, the following physicians of Ontario were elected to fellowship. Drs. A. Ross Alguire, Cornwall; Lorimer J. Austin, Kingston; John Lee Chabot, Ottawa; William J. Cook, Sudbury; Robert J. Gardiner, Kingston; Robert L. Gardiner, Ottawa; Gordon F. Jackson, Haileybury; Stanley F. Keyes, Kingston; Harry M. Lackner, Kitchener; George S. MacCarthy, Ottawa; George C. McIntyre, Toronto; Elmer W. Mitchell, Cobalt; Charles E. O'Connor, Kingston; Chas. E. Preston, Ottawa; George A. Ramsay, London; Robert V. B. Shier, Toronto; Duncan J. Sinclair, Woodstock; David Smith, Stratford; F. W. Ernest Wilson, Niagara Falls; Chas. A. Young, Ottawa.

QUEBEC

Dr. Geo. E. Armstrong, has been elected Dean of the Medical Faculty of McGill University.

Dr. and Mrs. A. E. Garrow, have returned from a three months' trip to Europe.

Dr. Ronald Levesque will sail by the Empress of France on a trip to Europe.

Four eminent members of the medical faculty of the University of Strassburg, who are making a tour of Canada and the United States for the Rockefeller Foundation, are in the City and will visit the hospitals. They are, Dr. Geo. Weiss, dean; Dr. Camille Duverger, Dr. Lucien Paurier and Dr. Pierre Masson. The visitors were officially received by His Lordship, Bishop Gauthier, rector of Montreal University and L. de L. Harwood, dean of the medical faculty and that night they were entertained at dinner at the Windsor Hotel. The subject of the evening's speech making was the *entente cordial* between Canada and France.

Hospital Extension Work is Completed.—Ste. Justine's Hospital, 1879 St. Denis Street, was opened for inspection, under the direction of Mrs. E. P. Benoit, wife of Dr. E. P. Benoit, president of the Hospital. A new wing has been added, making it possible to accommodate more than 150 children, where eighty were previously taken care of. The cost of the new building was $300,000, which is $170,000 more than was raised in the campaign of 1920. Another important feature of the building is the dispensary quarters on the main floor. Large numbers of the children can be brought every morning for attention, treated and then allowed to remain for a short time in the dormitory which has been provided. Dental rooms and quarters for surgical operations, such as for tonsils, and other throat diseases are also located on the

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main floor. Twenty-one private wards have been set apart on the second floor and operating cases are located on the third floor. The fourth and fifth stories are reserved for nurses quarters. Large open verandahs on each floor above the second make it possible for the children to be wheeled out into the sunshine and fresh air. Bishop Gauthier gave the benediction for the formal opening of the Hospital.

Another fire broke out in the Université de Montreal on November 14th, and the loss is estimated at about $300,000. This is very much to be regretted, as the reconstruction work of the building had just about been completed since the fire in 1919. The fire broke out in the top floor of the building, which was used by the anatomical, pathological and biological departments and included an up-to-date chemical department. A number of the directors of the Université were at the fire soon after its discovery and discussed the extent of the damage and the work which the reconstruction of the twice damaged building will entail. There had been a meeting of veterinary surgeons the evening before and they stated there was no sign of fire when they left the building at 9.30 p.m. By a freak of chance the body of the French-Canadian giant, Beaupre, which has been in the possession of the Université for several years, and which escaped cremation in the fire of 1919, again came through the flames untouched.

Quebec Hospitals Well to Front.—Hospital service to the public in Quebec has shown a marked advance in the past year, according to the fourth annual report of the American College of Surgeons issued. The report is based on a survey which includes personal visits to each hospital of fifty beds or over in the United States and Canada. The following hospitals were given a place on the "approved" list: Children's Memorial Hospital, Montreal; General de St. Vincent Hospital, Sherbrooke; Hotel Dieu, Montreal; Jeffrey Hale's Hospital, Quebec; Montreal General Hospital, Montreal; Montreal Maternity Hospital, Montreal; Notre Dame Hospital, Montreal; Royal Victoria Hospital, Montreal; Ste Justine pour Les Enfants, Montreal; Sherbrooke Hospital, Sherbrooke; and Western Hospital, Montreal. The last two hospitals named have instituted measures which ensure scientific medical care to their patients, but have not realized them to the fullest extent to date. For the first time this year hospitals of fifty bed capacity and upwards have been surveyed, These institutions in Montreal and Quebec show a marked improvement and place Quebec in the fore-front of states who are active in medical progress. Quebec is to be congratulated on its splendid showing and on its medical men; and its hospital superintendents and trustees who have made this advance possible.

Mental Hygiene Committee Formed.—The Montreal branch of the Canadian National Committee for Mental Hygiene was formally instituted at a meeting held at the close of last week, when it was decided to call this branch the Mental Hygiene Committee of Montreal. This reorganization was found necessary in order that the local activities should be separated so far as administration is concerned, from the National organization. The local branch will be a unit in the financial federation of the Montreal Council of Social Agencies. The following officers were elected: Honourary President, Sir Vincent Meredith; President, Dr. C. K. Russel; Vice-President; Mrs. R. W. Reford; Secretary, Dr. F. H. Mackay; Treasurer, David Law; Medical Director, Dr. G. S. Mundie; Directors, W. F. Angus, Lieut-Col. Herbert Molson, Mrs. C. K. Russel, Dr. Helen R. Y. Reid, Dr. C. F. Martin.

The Value of Vaccination.—There is much to give satisfaction in the report of the Medical Health Officer that there has not been a single case of smallpox in Montreal during the current year. This splendid state of affairs is declared by the official in question to be directly due to the efficacy of vaccination, and to the fact that there is no active opposition to-day to vaccination on the part of the population. Years ago in this city a large number of citizens had a strong prejudice against vaccination with the result that there were times when the dread malady was rampant and carried off many thousands, For years the health authorities, and especially the papers carried on an educational campaign favouring vaccination, and the wisdom of this move is seen by conditions in the city to-day.

ONTARIO

Dr. D. J. Wishart, formerly professor of Oto-laryngology in the University of Toronto faculty of medicine, has been appointed Professor Emeritus of laryngology. He is succeeded by Dr. P. G. Goldsmith.

Dr. C. K. Clark has been invited to deliver the Maudsley lecture on psychiatry before the British medico-psychological Association Congress in 1923.

Dr. John R. Curry, medical officer of the Scottish board of health, has been appointed to the chair of preventive medicine at Queen's University.

The medical research council of Great Britain has accepted the patents for the manufacture of insulin, the pancreatic extract isolated by Dr. Banting and Dr. Best in the physiological laboratory at the University of Toronto, and used so successfully in the treatment of diabetes. The council will act as sponsors for the distribution of insulin in Great Britain.

Dr. D. E. S. Wishart has commenced practice in Toronto, specializing in diseases of ear, nose and throat, after three and a half years special training in Boston, Philadelphia and Edinburgh.

The bulletin of the Canadian tuberculosis association, volume 1, No. 1, September 1922, (the first issue of bulletins by this association) appeared last month in small and compact form. It contains many details of particular interest in this particular line of public health. It is printed by the courtesy of the Federal department of Agriculture and has the editorial co-operation of departments Agriculture, Health and Statistics.

The Western Ontario Academy of medicine held a general session on Wednesday, September 20th, in the auditorium of the medical faculty of the Western University. Dr. W. E. Gallie spoke on the use of living sutures in operative surgery, and Dr. W. F. Banting, of the University of Toronto, on pancreatic extracts in the treatment of diabetes.

A session in tuberculosis was held at the Byron Sanitarium on Tuesday, October 3rd, the programme consisting of demonstrations dealing largely with diagnosis by Dr. F. H. Pratten and staff.

On September 13th, a meeting was held in Westminster psycopathic hospital, Drs. Maclean and Mitchel giving clinical demonstrations on neuro-syphilis.

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The executive committee of this active Western Ontario Academy of medicine consists of Dr. Charles A. Harris, president; Dr. George C. Hale, vice president; Dr. John I. Ferguson, treasurer; Dr. George A. Ramsay, secretary; Dr. F. J. H. Campbell, Dr. E. L. Hodgins, Dr. W. M. Shoebotham.

The Ontario section of the American College of Surgeons, held its first Ontario meeting in London on October 16th and 17th.

The University of Toronto did honour to the memory of the late Professor J. J. MacKenzie in a special service held in Convocation Hall on the afternoon of Sunday, October 1st. The service was in charge of Sir Robert Falconer, who was assisted by other members of the staff.

District No. Five of the Ontario Medical Association held a most successful meeting at the Academy of Medicine, Toronto, on Tuesday, November 7th, 1922. The attendance was large, the District throughout being well represented.

The Programme consisted of a morning session at the Toronto General Hospital, when a very interesting Medical Clinic was arranged by Dr. Duncan Graham, followed by a Surgical Clinic in charge of Dr. C. L. Starr, both of which were extremely interesting and well attended.

The luncheon at the Academy proved a popular feature, 120 being present. Everyone seemed to enjoy this informal function, and the very best spirit of good-fellowship prevailed.

At one o'clock, District Counsellor, Robert T. Noble, took the chair and, in a short address, strongly pleaded for more apparent evidence of confidence and cooperation, not only among ourselves but among our various associations.

W. H. Harris, President of the Academy, in a few well chosen words, welcomed the District Meeting and assured those present of the warmest and heartiest co-operation of the Academy.

E. R. Secord, President of the O.M.A., in a very forceful and well delivered appeal, set forth "The Aims and Objects of the O.M.A.", urging strongly that something in the way of better medical legislation should be forcibly brought before Parliament.

The afternoon session consisted of the following programme: Neurasthenia, Diagnosis and Treatment—J. E. Webb; The Age Incidence of certain Diseases in children as an aid to diagnosis—F. F. Tisdall; the use of quartz light (ultra violet radiation) in medical practice—G. W. Ross; lumbar puncture in diagnosis and treatment, with demonstration—W. Magner; A case of Tetanus, with recovery—W. D. Sharpe. This scientific programme was splendid throughout and Osler Hall was filled to capacity.

At 6:30 the Counsellor of the District gave a delightful dinner at which thirty-five representatives of the District were present. The host made use of the occasion to give his guests an opportunity to speak freely of matters of vital importance to all of us. Many made short speeches and it was quite evident that a very real and true spirit of friendship and cordiality prevailed.

The stated meeting of the Academy which had been arranged by Dr. Alex. Mackenzie, Chairman of the section of medicine, was held in the Medical Building. It consisted of demonstrations by Prof. J. J. R. Macleod and staff, and proved most interesting and instructive to a large audience. The demonstrations were asfollows: (1) The Measurement of Energy Balance by the Tissot Method; (2) Some fundamental experiments in cardio-vascular physiology; (3) The effect of insulin on normal rabbits; (4) Tetany following forced breathing. The thanks of the meeting are due the Academy of Medicine, Toronto, for its helpfulness and hearty co-operation.

District Number One of the Ontario Medical Association, comprising the counties of Essex, Elgin, Kent, Lambton and Middlesex, met at Chatham on Wednesday, October 25th, with close upon ninety practitioners present.

During the afternoon, the following programme was presented: The Realm of Roentgenology,—Dr. Geo. McNeil, London; Rheumatic Fever and Endocarditis,—Dr. Duncan Graham, Toronto; The Management of some common complaints such as Nosebleed, Hoarseness, Sore Throat, Difficulty in Swallowing, Nasal Obstruction and Discharge, Earache, Aural Discharge, Vertigo and Tinnitis, Deafness,—Dr. Perry G. Goldsmith, Toronto; The treatment of some common Gynaecological Conditions,—Dr. F. W. Marlow, Toronto.

At seven o'clock, the gathering sat down to a sumptuous banquet as guests of the physicians of Chatham. The evening programme was provided by Dr. E. R. Secord, of Brantford, and Dr. T. C. Routley, of Toronto, President and Secretary respectively of the Ontario Medical Association.

Before the close of the evening, the Kent County Medical Society was organized with Dr. J. W. Rutherford, of Chatham, as President, and Dr. E. C. Riseborough, of Chatham, as Secretary.

The Ontario Medical Association has recently issued and distributed to over 3,500 practitioners in the province, its new post-graduate schedule. This schedule contains 307 contributions offered by members of the medical pro-

SUMMARY OF RESULTS OF EXAMINATIONS
OF THE
COLLEGE OF PHYSICIANS AND SURGEONS OF ONTARIO

	Toronto			Queen's			Western			McGill		
	Tried	Passed	Failed	Tried	Passed	Failed	Tried	Passed	Failed	Tried	Passed	Failed
Fall, 1917	5	4	1	8	5	3	5	3	2	1	1	0
Spring, 1918	88	66	22	22	16	6	15	12	3	8	7	1
Fall, 1918	17	13	4	5	4	1	2	1	1	3	2	1
Spring, 1919	43	34	9	22	14	8	18	12	6	8	7	1
Fall, 1919	19	17	2	9	3	6	6	6	0	4	4	0
Spring, 1920	84	62	22	20	11	9	10	8	2	10	8	2
Fall, 1920	27	25	2	10	6	4	2	1	1	6	2	4
Spring, 1921	122	96	26	27	22	5	14	11	3	16	11	5
Fall, 1921	22	20	2	5	2	3	0	0	0	6	6	0
Spring, 1922	143	117	26	34	26	8	21	18	3	16	9	7
Totals	570	454	116	162	109	53	93	72	21	78	57	21

Other Universities had a total of 11; Passed, 8; Failed, 3.

NEWS ITEMS TO APPEAR IN THE FOLLOWING ISSUE, AND TO BE OF VALUE MUST BE RECEIVED BY THE EDITOR BEFORE THE 15TH OF THE MONTH.

fession in the province. Each Society affiliated with the Association is entitled to eight speakers during the year free of cost. This is a most unique and praise-worthy piece of service being conducted by the Association in the interests of the profession at large throughout Ontario.

The profession of Ontario have recently been asked by the O.M.A. to supply from their own knowledge some ideas as to the amount of unattended sickness which exists in the province. To this end, a questionnaire has been submitted to the profession, the returns of which it is hoped will be of considerable value to the Association in preparing a report for further reference on this important matter.

Reports from the committee in charge of the forty-third annual meeting indicate that the men of the Border Cities have their plans most thoroughly laid for the forthcoming meeting. The greater part of the programme is already arranged, ample accommodation in Windsor has been provided for, and the detail work which has been done augurs well for one of the most enthusiastic and interesting meetings the Association has ever held.

The members of District No. 7, of the Ontario Medical Association (comprising the counties of Frontenac, Lanark, Leeds and Grenville, Lennox and Addington), met at the General Hospital, Kingston, on Monday, November 13th, under the Chairmanship of Dr. J. F. Sparks, the Counseller of District.

Forty-six (46) members registered, while Dr. Norman Gwyn, of Toronto, and Drs. Secord, of Brantford, and Routley, of Toronto, were also present.

The afternoon programme was purely clinical, and the following cases were presented and discussed: Dr. G. W. Mylks.—Congenital Sarcoma of Tibia—Amputation at seven days old—Recovery—No signs of recurrence to present date. Dr. B. Hopkins.—Artificial Pneumothorax in Tuberculosis—Pleural shock three weeks ago. Dr. D. E. Mundell.—Series of cases from Sydenham Hospital showing bone and tendon transplantations, Ventral hernia, Chondrosarcoma of testis and x-ray burn. Dr. S. J. Keyes.—(1) Case of Osteogenesis imperfecta—one infant of twins—Both show blue sclerotics but one is quite normal; (2) Retroperitoneal Haematoma (Right Kidney region)—Operation—recovery. Dr. R. R. MacGregor.—(1) Case of Coeliac disease; (2) Case of Marasmus—Feeding charts etc., demonstrated. Dr. R. J. Gardiner.—Case of Hernia through diaphragm in infant. Operation—recovery. Dr. L. J. Austin.—(1) Exostosis of Femur in Youth—Diagnosis from osteo sarcoma; (2) Case of Acromegaly. Dr. Cumberland.—Case of Pellagra. Dr. E. Ryan.—Case of Senile dementia—Suicidal and homicidal type. Dr. J. C. Connell.—Series of cases of interstitial Keratitis. Dr. B. Cornell (Brockville) read a paper on "Various paraesthesias of legs noted in benign pelvic growths"—Paper illustrated by lantern slides. Dr. I. G. Bogart.—Case of Lupus erythematosus shown last January Meeting—Since given high frequency brush—Lesions completely cleared on face and neck—Still present on hands.

At 7 30 p.m., fifty-six members and guests were entertained at dinner at the Frontenac Club, the Kingston and Frontenac Medical Society being the hosts. Dr. Norman Gwyn, of Toronto, gave an address on "Sir William Osler", explaining the training which "made the man". Dr. Secord, the President, and Dr. Routley, the Secretary of the Ontario Medical Association, then gave addresses on the activities of the Association and the work of the various Committees, and outlined plans for future development.

BRITISH COLUMBIA

Dr. R. W. Irving and Dr. H. H. Murphy, of Kamloops, Dr. J. W. Arbuckle, of Vernon, and Dr. W. H. Lang, of Vancouver, have recently been made Fellows of the American College of Surgeons.

The first general meeting of the winter session of the Vancouver Medical Association was held on October 3rd, when Dr. J. J. Mason, the president, delivered his presidential address on "The future of the Vancouver Medical Association". A very interesting programme has been arranged for the session, the subjects for discussion being Diabetes, Infant Mortality in Obstetrical Practice, Gastric and Duodenal Ulcer, and Anaesthesia, local and general.

The first clinical meeting of the Vancouver Medical Association was held at the Vancouver General Hospital on October 7th. The subject under consideration was, Acute Suppurative Otitis Media, Drs. H. M. Cunningham, G. W. Sinclair, J. M. Pearson, J. A. Smith, Colin Graham and H. H. McIntosh taking part.

Dr. J. A. Sutherland, of Vancouver, has left for England to pursue post-graduate work. Dr. H. B. Gourlay is at present in the East for the same purpose. Dr. G. S. Gordon has returned from abroad and resumed practice in Vancouver. He has been chosen to deliver the Osler Lecture before the Vancouver Medical Association in January. Dr. E. J. Foster has also resumed practice in Vancouver after two years spent in London in post-graduate work. Dr. C. M. Eaton, who was acting as Dr. Foster's *locum tenens*, has left Vancouver to take charge of the hospital in Atlin, B.C.

A letter has recently been received by the B.C. Medical Association concerning the sale of bonds of the *Canadian Medical Association Journal* and it was decided that the Provincial Association take two bonds and that each local Society be asked to consider the purchase of at least one bond; the Executive Secretary to endeavour to dispose of as many bonds as possible to individual members of the Profession.

The membership campaign of the B. C. Medical Association carried on during the past eleven months has been successful beyond the most sanguine expectations. There are now very few medical men who have not joined and this may be attributed to the exceptional financial conditions obtaining in the larger cities. It is hoped, however, that the full unification of the profession will be attained before the end of the year.

District 4 Medical Association held a very successful meeting on October 4th, at Kamloops, B.C. Addresses were given by Dr. A. Cumming, of Vancouver, on "Goitre with relation to basal metabolism"; Dr. C. S. McKee, of Vancouver, on "Blood chemistry"; Dr. R. T. W. Herald, of Kelowna, on "Nose and throat work in its relation to the general practitioner", and Dr. M. G. Archibald, of Kamloops, on "Anaesthesia". The visitors were entertained at a banquet.

NEWS ITEMS TO APPEAR IN THE FOLLOWING ISSUE, AND TO BE OF VALUE MUST BE RECEIVED BY THE EDITOR BEFORE THE 15TH OF THE MONTH.

Obituary

Dr. J. B. Cosby died on Sunday, October 1st.

Dr. Stuart Johnstone, an old resident of Toronto, died in Chicago on September 29th.

Dr. Malcolm Galbraith, a well known physician of Sarnia, died there on September 17th, aged 43 years.

Dr. Florence McCormack, who for some years had been assisting her husband in the management of the High Park Sanitarium in Toronto, died October 5th. Born in Iowa, Dr. McCormack graduated at Illinois University, coming later to Toronto for post graduate work.

Dr. E. E. Simard, a retired physician, well-known in Montreal and in Westmount, where he had resided at 369 Claremont Avenue for the past twelve years, died recently at the Hospital for Incurables, Decarie Avenue, at the age of sixty-four. Though he was far from well for several months, it was only in the past few weeks that the illness assumed a critical phase, and he was removed to the hospital a month ago. Dr. Simard was a graduate of the old Victoria College and afterwards continued his studies at the Sorbonne, in Paris, remaining there for three years. Returning to Canada he practised his profession for twenty-five years. He was a clever physician, a man of wide reading, a courteous gentleman and a faithful friend. His wife predeceased him by many years. Mr. Arthur Simard is a brother, and Mrs. A. D. D'Estmoville and Mrs. E. Robert are sisters.

Dr. S. N. Henry, a medical veteran of seventy-three years died in Toronto on October 9th. Before coming to Toronto he had practiced forty-three years in the town of Harriston where he had acted as Mayor and as chairman of the Board of Education. Dr. Henry was one of an old medical family a son of Dr. Thomas Henry and brother of Dr. James Henry of Orangeville. One of his surviving sons practices medicine in Norwich, Ont.

Dr. J. J. Addison died at St. George on October 7th in his 69th year. Graduating at McGill in 1884 he had carried on an active practice for thirty-four years.

Professor J. J. MacKenzie, the well known head of the department of pathology of the University of Toronto died in the Calydor Sanitarium, Gravenhurst on August 1st. The tragic circumstances of his illness and death, an endocarditis running for nearly a year before its fatal issue are well known to the hundreds of his students living in Ontario. Other details of his interesting and active life will appear in this Journal.

Dr. Steven West, of Angus, Ontario, died on Oct. 30th, age 61 years. He had been in active practice in Angus for over 30 years.

Dr. Alfred Yale Massey of Belleville, who for 20 years had been a medical missionary in the Belgian Congo died there on August 22. Dr. Massey was educated at Albert College, and University of Toronto, and graduated from Trinity University medical school in 1898. Previous to going to Africa he had engaged in medical missionary work in Labrador. In Africa he had collaborated with Dr. Koch in his work on tuberculosis and in sleeping sickness. He was for some years chief medical officer for the Belgian government in Africa and his work on sleeping sickness had been commended in many quarters, particularly by the University of Oxford.

Dr. J. G. Scott of Ottawa, died suddenly on Oct. 29th, while on a hunting trip.

Dr. Garnet L. Hunter, a graduate of the University of Toronto, died early in November from pernicious anaemia after a long illness. Dr. Hunter had been practicing in the state of New York, and during the war had been employed in lecturing upon Canada's share in the conflict. Dr. Hunter was the son of the late Rev. Dr. Hunter, former pastor of the Sherbourne St. Methodist Church, Toronto.

Book Reviews

Collected papers of the Mayo Clinic, Rochester, Minnesota. Edited by Mrs. M. H. Mellish. Vol. XIII, 1921. Published May, 1922. Octavo of 1,318 pages, with 392 illustrations. Philadelphia and London, 1922. Published by W. B. Saunders Company. Cloth, $12.00; Canadian Agents, The J. F. Hartz Co., Ltd, Toronto, Ont.

It is probable that no series of medical publications has done more to place within convenient reach of the reader the latest information concerning the most advanced thought with regard to the various problems of surgery and its allied branches than has the yearly collection of papers emanating from the distinguished group of men forming the Mayo Clinic. This, the thirteenth volume, lives well up to the expectations established by acquaintance with the preceding editions. There is practically no live surgical topic to which reference is not made within its contents, and in all instances the conclusions arrived at are based on intensive study, mature consideration and sound surgical judgment.

It is obviously impossible to make detailed reference to each of the 117 articles making up the volume, but perhaps at the present time greatest interest will attach to the magnificent series of articles on the thyroid gland by Plummer, Boothby, Kendall, Pemberton, Judd and Wilson. Dr. William J. Mayo's address on "The Medical Profession and The Public" should be read and assimilated by every member of the profession. The volume will prove a mine of information for every surgical worker, and should find a place in every medical library. E. R. S.

International Clinics. Thirty-second series. Volume III, 1922. Edited by H. R. N. Landis, M.D., Philadelphia. J. B. Lippincott Company, Montreal, Quebec. Price, $2.50 per volume or $10.00 for the series of four.

The Clinics keeps up to its usual high standard. Its first article of fifty pages on "Oral Sepsis", by Mead, is one which will well repay reading and study by every man in general practice. This is followed by Goodman's paper on transplantation of organs and tissues, which gives a good presentation of what has been accomplished.

Kraemer's paper on the cultivation of medicinal plants is a strong argument for the production at home of many plants now imported. He states that many plants such as digitalis and belladonna grown in Michigan are more potent than those imported. Other important contributions are on the subjects of nervous syndromes produced by spinal lesions, and gastric disturbances in old age. Feeble-mindedness, rickets, chest surgery, plastic eye surgery are other titles in this excellent volume. J. H. E.

A Guide to Regional Anatomy, By Professor John Cameron, Dalhousie University. Published by the Ross Print, Halifax, N.S., 1920.

This small volume of 178 pages is designed 'to provide the student with a brief, though concise guide to his work in the dissecting room, and after a practical trial we can say that it will subserve its purpose. We think, however, that the work is far better suited for those who wish to make an easy and rapid revision of their work. The upper limb, for example, is concisely described in sixteen pages, and the brain in fourteen. This brevity of description extends to the directions for dissecting, which would appear to require amplification by a demonstrator; indeed the author mentions that the skin must be reflected under such supervision. The lack of illustrations, which could not be provided at the very modest price the book is published at, must be a drawback to anyone dissecting for the first time, though it is fair to note that under the author's method of teaching, the student rightly makes his own diagrams and sketches. The dissection of the joints is not described. The terminology is not uniformly either the old or the Basle nomenclature, and the index refers to sections only. For these reasons, therefore, we would recommend the book more heartily as a revisional guide, a purpose it will serve admirably, or as an outline to be used in conjunction with a text-book, rather than as a student's first introduction to his work in the dissecting room. S. E. W.

A Students Manual of Obsteology and Arthrology. By Professor John Cameron, Dalhousie University. Published by the Ross Print, Limited, Halifax, N.S., 1922.

This book is designed as a companion to the author's Guide to Regional Anatomy, and with the same idea of lightening the burden of the student its descriptions are rendered as brief as is consistent with practical utility, and the text is confined to 206 pages. This book, however, is a much more ambitious and successful product in every way. All the illustrations, ninety-eight in number, have been prepared by the author, and are excellently clear line-drawings, with novel features in the type used for the names on the bones, and in the skilful use of stippling to represent ligaments. The old terminology is used throughout. The text is admirably spaced and headed, and the binding and general make up are a credit to the publishers.

We would criticise the disproportion between the brief amount of description given to the skull as a whole, as the student will consider it in practice, and the details of articulations and ossification of the separate cranial bones, in a work of this brevity. Also, more consideration might have been given to such features as the arches of the foot, the epiphyses, the air-sinuses of the nose, which are all briefly dismissed, at the expense of the list of homologies of the limb bones, which are of less importance to the student. A note, too, might have been added on the development of the joints; and this section as a whole, whilst naturally correlated with the osteology, might have been represented in the author's above noted Guide in dissecting room form for study in the fresh condition.

The author is to be congratulated on the success which he has attained in cutting down the amount of detail that ordinarily and uselessly encumbers many works of this kind, and in his endeavour to provide the medical student in these two books with the briefest possible exposition of the subject. S E. W.

The Study of Anatomy. By Professor S. E. Whitnall, McGill University. Published by the Renouf Publishing Company, Montreal.

A small brochure written for the medical student as an introduction and general guide to his methods of study of human anatomy. An attempt is made to engage his interest beyond the merely technical part of the work by expounding the principles upon which human anatomy is founded and investigated. He is shown the natural relation of physiology to anatomy, and how almost universally throughout the body, form can be interpreted in terms of function. The essential correlation between gross and microscopic or histological anatomy, the value of embryology and morphology in aiding the understanding of many complex regions and conformations, and the interest and importance to the medical man of some acquaintance with physical anthropology, are all illustrated by reference to what the student should be taught to observe for himself in the room. Suggestions are given as to the use of a text-book in conjunction with the practical work, and on the choice of books for collateral and general reading. Finally, advice is tendered as to the best methods, according to the author's views, of most readily obtaining a lasting and useful knowledge, not of the details, but of the main facts and principles of structure of the living human body.

The author's aims are to make the study of anatomy of wider interest than is connoted by mere dissection, to emphasize its educational value in learning to observe and seek cause, and to give expression to the revival of functional anatomy. For these reasons the book may be of interest to senior members of the profession besides those to whom it is primarily addressed.

The Practice of Medicine. A. A. Stevens, M.D., professor of applied therapeutics, University of Pennsylvania. 8vo, pp. 1,106, 1 plate, 35 illustrations. Price $7.50. Philadelphia, W. B. Saunders Co. Canadian Agents, J. F. Hartz Co., 1922.

This new volume on practice is similar in arrangement and its general make up to the well-known text books of Osler and Anders. The author has succeeded in presenting the essentials in the pathology, diagnosis, and treatment of medical diseases. He has avoided much that is theoretical, giving an excellent summary of our present day knowledge. Many tropical diseases are included. Under filariasis it is stated that the filarial embryo is injected into the blood of man by the mosquito. This requires correction. Among other slips is the generic name Dracunculosis for the Guinea-worm, and under mushroom poisoning, the statement that symptoms due to amanita phalloides set in after a latent period of eight to fifteen days, when it should read hours.

The references to the literature appear conveniently as foot notes. Important papers as late as 1921 have been consulted. The work is well indexed and can be recommended as a good text book of modern medical practice, a field, however, which already appears well filled.

J. H. E.

The Rockefeller Foundation—(Published by the Rockefeller Foundation, 61 Broadway, New York City)—being the Annual Report for 1921.

This report is a remarkable contribution to the "Inter-relations of the Medical Profession and the Public", for although it does not specifically purport to have that character, it is in fact an actual account of such inter-relations, already established on a great scale.

President George E. Vincent, in this report, reviews the work of the Foundation in a most interesting manner; following his review, we note the International Health Board Report, the Report of the China Medical Board and finally that of the Board of Medical Education. A map of the world is used, page 485, to show the points where the Rockefeller public health and medical activities are in operation.

In 1921, financial aid, dependent on reaching certain standards was extended to five medical schools in Canada and to one each in England, Belgium, Brazil and the United States. In China one medical school in Pekin is operated completely, while three other medical schools, five pre-medical schools and twenty-nine hospitals were aided. Two large public health schools, one at Harvard, one at Johns Hopkins, were heavily endowed, that at Harvard receiving two million dollars, that at Johns Hopkins a quarter of a million, while at the same time the celebrated Pasteur Institute in Paris was assisted. Besides these preparations for future development the immediate needs of preventive work were met in a very generous way. A campaign against yellow fever was financed in Mexico and in Central and South America; aid was extended to ten Southern States and several foreign countries to carry on a campaign against malaria, and hookworm disease.

Emergency relief necessitated by the Great War to the extent of $1,000,000 was extended to European children, and to medical schools in nine European countries. Besides these, an infinitude of minor enterprises were conducted; amongst them we note that 157 fellowships were given to students of eighteen countries for the study of hygiene, medicine, physics, and chemistry. "Cure looks through a microscope, prevention through a telescope" is the quotation with which President Vincent begins his discussion of the year's work. "The progress of public health depends upon the appreciation, sympathy and support of the medical profession."

Preliminary medical education for health officers and definite public health training for all, medical men included, who are admitted to public health practice is advocated most strenuously. It is pointed out (page 17) that less than 11% of those now active in public health have had public health training other than through "experience"

The report itself should be read by every medical man interested in the future of medicine, as a description of a powerful organization, "justified by its works."

The Rockefeller Foundation is, and will continue to be, one of the few great forces, not merely national or international, but truly world-wide in its influence in advancing medical science and preventive medicine.

H. W. H.

The Cleveland Hospital and Health Survey—Two Years after. Published by the Cleveland Hospital Council, 602 Electric Building, Cleveland, Ohio.

This is an account, looking backwards, of the results of the Cleveland Hospital and Health Survey made in great detail and with excellent facilities for investigation in 1919-20 by a staff of investigators headed by Dr. Haven Emerson, of New York. A review of the report of the Surveyors was published in these columns May, 1921, page 396. The present volume deals with some of the changes brought about by the Survey, and with the reasons for failure to make other changes suggested by the Survey. In general the conclusion reached is that great gains were made, and that the Survey, while like all human operations not infallible, made an excellent "diagnosis" of the situation in Cleveland and suggested excellent treatment for the same.

H. W. H.

A System of Clinical Medicine dealing with the diagnosis, prognosis and treatment of disease. By Thomas Dixon Savill, M.D., London. Sixth Edition; pp. 951, XXVIII, with four plates in colour and 172 figures in the text. Price 28S. London, Edward Arnold and Co., 1922.

In the preface, Agnes Savill states that the whole book has been carefully revised and much has been entirely re-written with the aid of experts in special departments. The general design of the work follows that of the earlier editions and approaches the subject in a manner quite different from that adopted in the usual text book on medicine. Each disease is approached from its symptomatology, and symptoms are traced to the diseases which may be concerned. We confess we would like to see this book more widely known in Canada and more widely read by the student and practitioner. Some of the articles could be improved. For example, under malignant disease of the lung it is stated that the type of cell found in the effusion after paracentesis is diagnostic in many cases. Yet nothing is said as to the type of cell to be looked for, and in the paragraph in the laboratory section dealing with pleural effusion, there is no reference to cytology nor to the desirability of centrifuging the specimen. Nor is there any suggestion that pleural effusion may be due to tubercle excepting in those cases in which it recurs after aspiration.

Much of the subject matter appears in small type, which allows the inclusion of a wealth of material. In the small type is to be found matter relating to unusual diseases, and to some clinical methods and laboratory work, such as renal efficiency tests, urinary sediments, and parasites.

J. H. E.

Clinical Diagnosis. Case Examination and the Analysis of Symptoms. By Alfred Martinet, M.D., Paris, with several collaborators. Translated from the 3rd edition by Louis T. de M. Sajous. Royal 8 vo, pp. 1,388, XIX, several colour plates and 895 illustrations in the text. Price $14.00. Philadelphia, F. A. Davis Company, 1922.

The work is divided into two volumes, the first dealing with physical and laboratory diagnosis, the second with analysis of symptoms. Ten pages are devoted to a discussion of the causes of mistakes in diagnosis. Special medical diagnostic procedures are considered in relation to the various tracts or systems concerned and this is followed by the general technical procedures which may be used. Thirty pages are devoted to the discussion of principles and the conduct of a systematic medical examination.

The work appears to have had a favourable reception in France and generally speaking it is a good guide to clinical diagnosis. Some parts are rather too skeletal in construction while others are full and comprehensive, while the wide spacing of the text makes much bulk. The chapter upon the examination of the lower respiratory tract is made up principally of diagrams with findings added in the form of graphic symbols. This forces the reader to acquaint himself with the author's graphic system, and as different authors and clinicians use different systems the diagrams may become confusing. This method does not seem satisfactory.

Functional tests of the circulation receive ten pages and the author gives in full his method. His description of Weil's method of differentiating functional from organic heart murmurs is interesting.

Though incomplete in many respects, there appears to be much that is of value which is not available in works by English authors. As a presentation of the accepted clinical methods of the French School, it should receive a welcome.

J. H. E.

Books Received

The Art of Anaesthesia. By Paluel J. Flagg, M.D., Third edition revised, 371 pages, with 136 illustrations Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Gonorrhea and Impotency. Modern treatment by Edwin W. Hirsch, S.B.M.D., 168 pages, with numerous illustrations and drawings. Published by The Solar Press, 209 South State St, Chicago, Ill. 1922.

The management of the Journal is pleased to announce that it has secured the well-known firm of BAILLAIRE, TINDALL & COX, Covent Garden, London, W.C.2. as exclusive advertising agents for the British Empire with the exception of Canada and Newfoundland.

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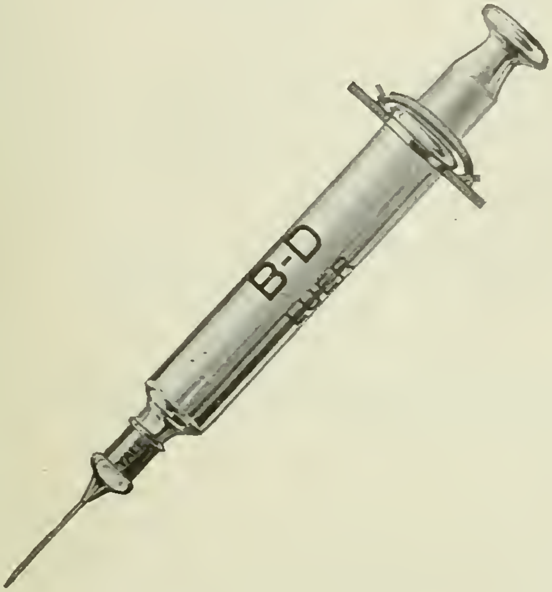

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The Canadian Medical Association Journal

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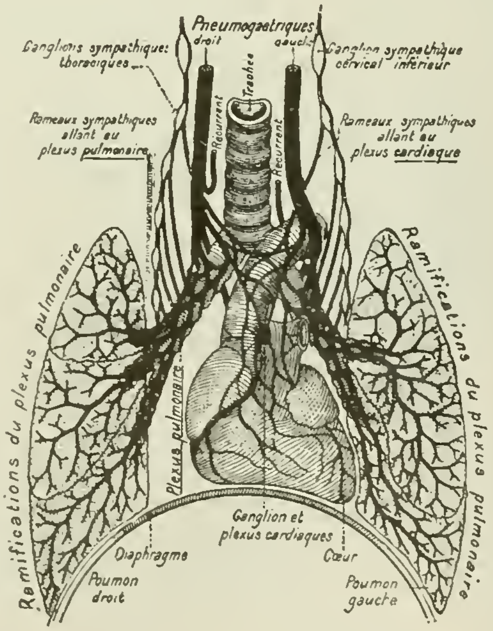
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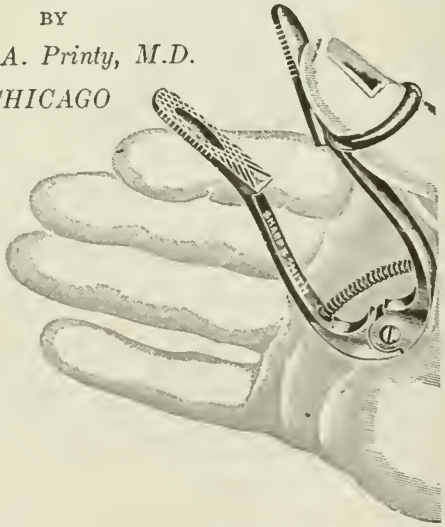

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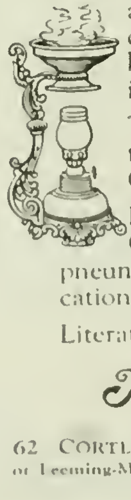

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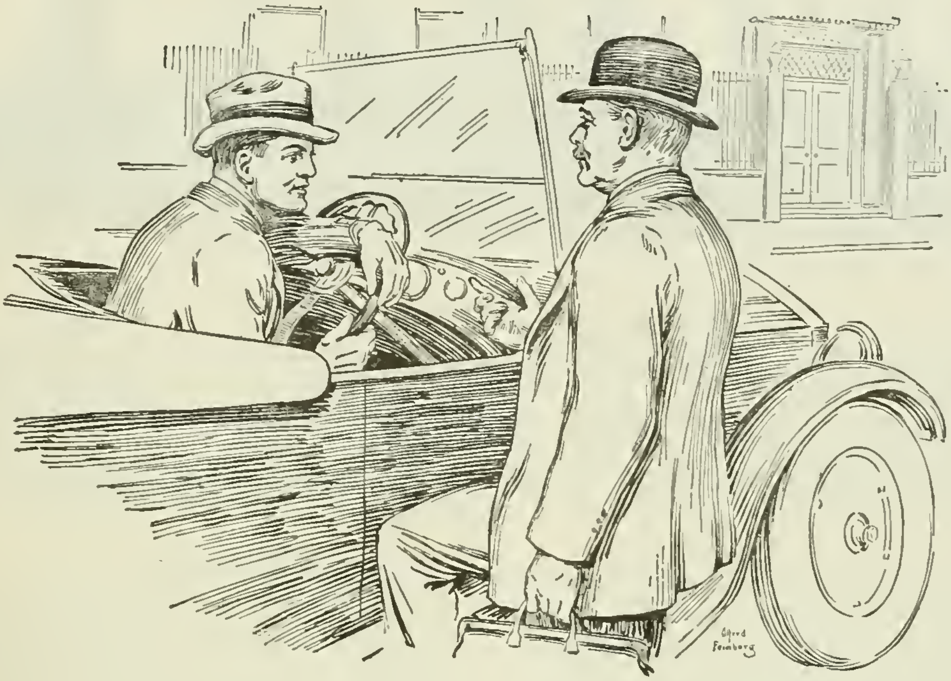

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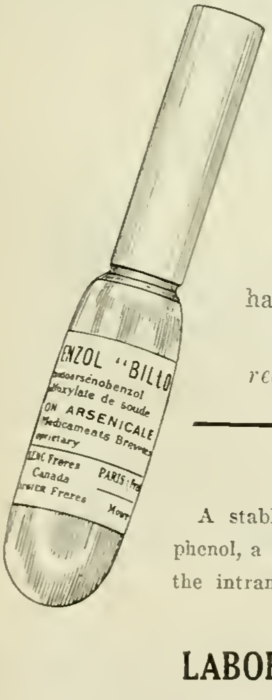

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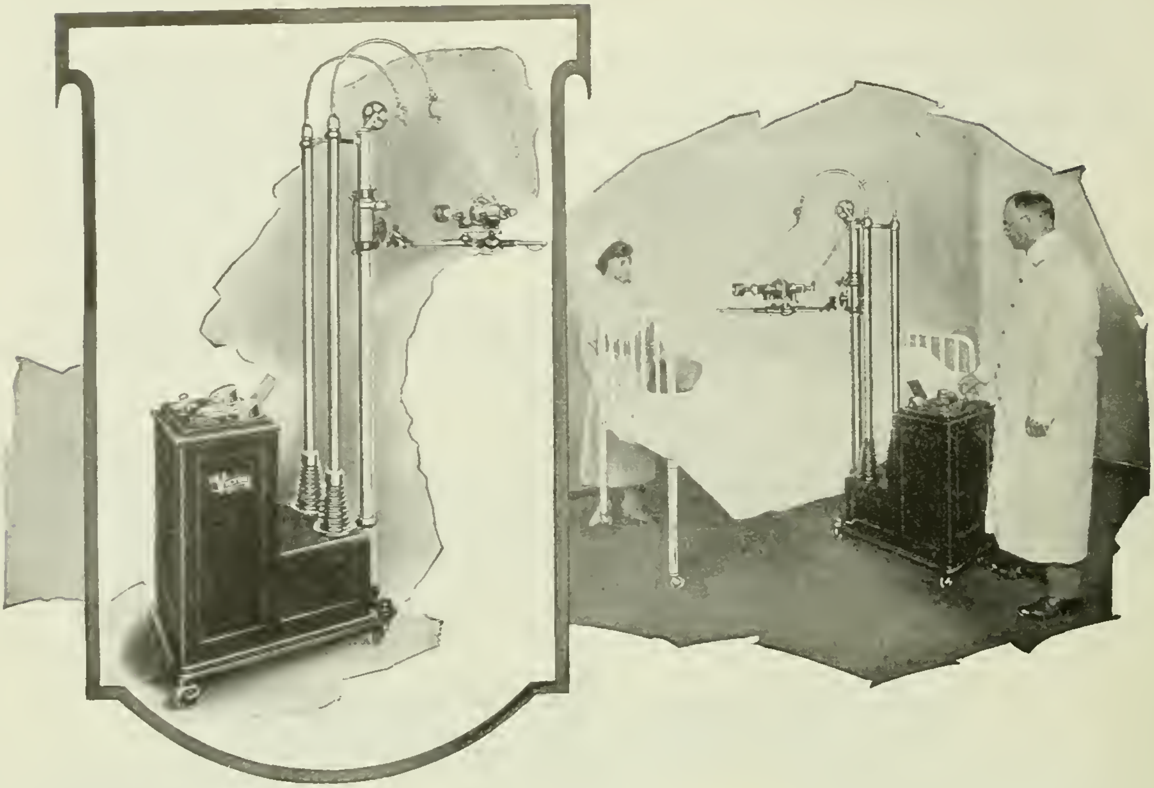

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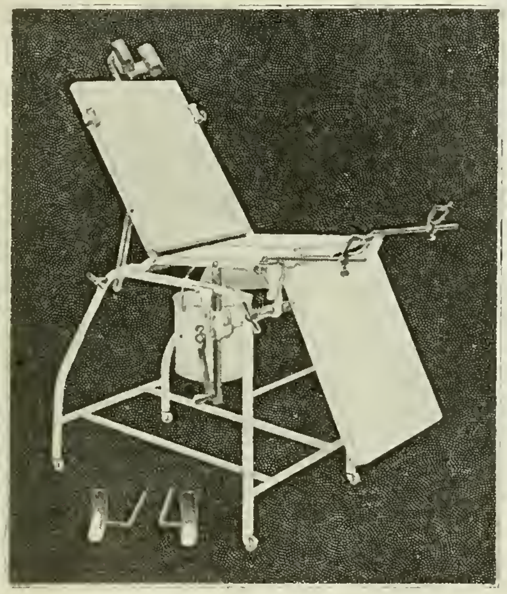

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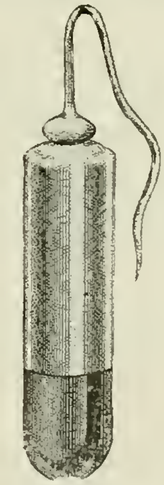

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